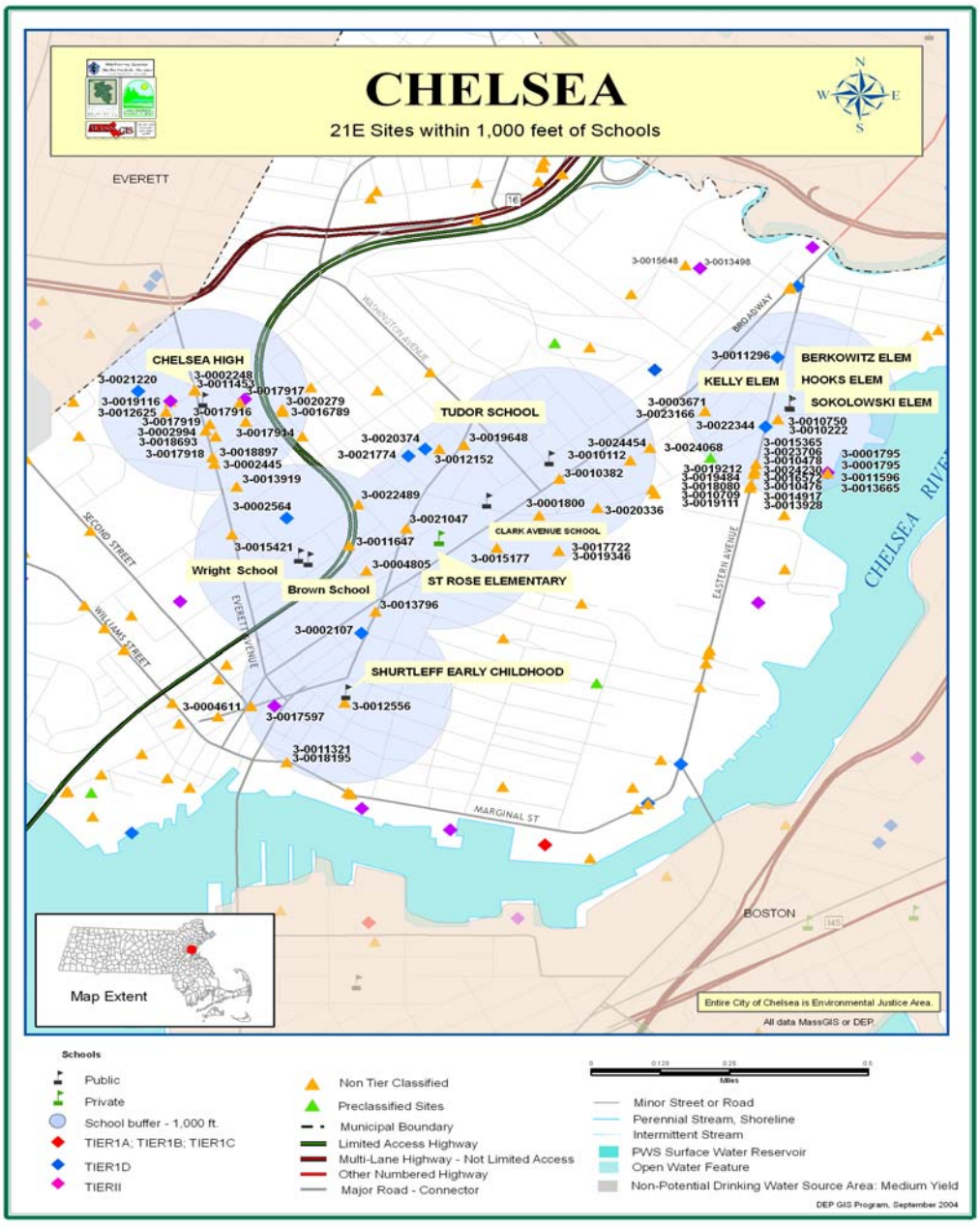
AN INVESTIGATION TO DETERMINE WHETHER WASTE SITES ARE AFFECTING SCHOOLS IN CHELSEA, MASSACHUSETTS



Prepared by the Bureau of Waste Site Cleanup
Massachusetts Department of Environmental Protection
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EXECUTIVE SUMMARY

The mission of the Massachusetts Department of Environmental Protection (DEP) is to protect and enhance the quality of the Commonwealth's natural resources – its air, water and land – in order to protect the health, safety and welfare of its citizens. DEP's Bureau of Waste Site Cleanup is charged with ensuring timely and effective responses to over 2,000 environmental emergencies such as oil spills and chemical fires each year as well ensuring that cleanups that are already underway are completed at more than 6,000 contaminated properties across the Commonwealth. The regulations that govern the investigation and cleanup of chemical spills and contaminated property in Massachusetts are known as the Massachusetts Contingency Plan (the MCP).

DEP conducted a targeted exposure potential and compliance evaluation of MCP sites and facilities that generate hazardous waste in the City of Chelsea to determine if they have the potential to adversely impact the health, safety and welfare of school children, a particularly sensitive receptor group. DEP evaluated all response actions conducted at MCP sites located within 1000 feet of Chelsea schools. The MCP sites in the study area were prioritized based on the likelihood that soil or groundwater contamination might pose risk to children. Highest priority was given to releases that could impact indoor air in nearby schools or homes and sites where children might come into contact with contaminated surficial soil or could be exposed to fugitive dust blowing off-site.

DEP identified a total of sixty-four (64) reported releases of oil or hazardous materials at locations within 1000 feet of eleven (11) schools in Chelsea.

DEP's exposure potential evaluation determined the types and concentrations of chemicals released at a site and whether or not the chemicals impacted soil, groundwater or air quality, and ultimately, whether any "sensitive receptor" (such as a child) could be exposed to or come into contact with environmental contamination. DEP designed the compliance evaluation to determine whether the parties legally required to clean up the MCP sites were conducting response actions in accordance with MCP performance standards and cleanup deadlines.

To implement the exposure potential and compliance evaluations, DEP conducted file and data reviews, audited cleanup reports, and evaluated the compliance status of the parties required to cleanup the MCP sites identified throughout the study area. DEP also conducted targeted inspections of selected facilities that generate hazardous waste in the study area.

The exposure potential evaluation revealed the following:

- No sites were found that pose a health risk to nearby residents or school children as a result of a direct contact hazard or airborne dust from surficial soil contamination;

- No site conditions were found that could pose a health risk as a result of indoor air contamination caused by vapor migration from contaminated groundwater into nearby homes or schools; and
- Drinking water is not a potential exposure pathway since Chelsea is served by a water supply system that obtains its water from the Massachusetts Water Resource Authority (MWRA) system.

The compliance evaluation showed that response actions conducted by parties responsible for the contamination have been conducted properly at the majority (84%) of sites within the study area. Although site conditions were not found to pose risk to schools or nearby residents, DEP identified ten (10) sites where response actions were found to be inadequate or behind schedule. Enforcement actions were initiated in order to get the parties responsible for the cleanups back on schedule. As a result of its enforcement efforts, DEP has raised the compliance rate to 92% and anticipates the remaining locations will return to compliance in the near future.

DEP also evaluated the compliance status of 126 MCP sites, at which response actions have been completed, that were not captured within the 1000-foot radius of a school. DEP conducted Level 1 audits on fifty-two (52) sites and the equivalent on twenty-six (26) others. Seventy-one (71) releases were determined to only warrant a cursory review (pre-screen) because they were either small volume surface spills/vehicular accidents or sites without any nearby sensitive receptors. DEP completed nineteen (19) Level 2 audits in the City and two are pending completion. From the Department's review of these sites, two were recommended for a Level 3 audit which are underway and two were recommend for inspections. The inspections were completed at two sites with an Activity and Use Limitation (AUL). The two sites inspected were both school properties, the Mary C. Burke Complex and the Shurtleff Early Childhood Center. No violations were identified regarding the obligations of the Activity and Use Limitation. An AUL is used to prevent risk to human health by restricting or limiting site activities and uses in areas of the site where residual contamination exists.

DEP is committed to continue auditing response actions at MCP sites and taking enforcement actions when necessary to ensure that contamination is cleaned up properly and on time in Chelsea and across Massachusetts.

An electronic copy of this report can be found at DEP's web site:
Mass.Gov/dep/bwsc/school.htm.

If readers would like more information about this evaluation or any specific MCP site in Chelsea, please contact:

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1.0 INTRODUCTION

Many of us are aware of locations in our communities that have been affected by environmental contamination. In some cities, residents in more densely populated urban neighborhoods live side-by-side with numbers of large and small sources of environmental pollution which may pose a health risk if not properly controlled. The Department of Environmental Protection (DEP) is responsible for making sure that environmental contamination is cleaned up properly and in a timely manner as well as ensuring that our air and water is clean, solid and hazardous wastes are managed safely and wetlands and coastal resources are preserved. DEP is also committed to keeping citizens informed about important environmental matters that may affect their communities. To that end, DEP's Bureau of Waste Site Cleanup (BWSC) has prepared this report to update the citizens of Chelsea on the status of environmental cleanups in certain key areas of the city.

The regulations that govern the investigation and cleanup of chemical spills and contaminated property in Massachusetts are known as the **Massachusetts Contingency Plan**[1] (the "**MCP**"; 310 CMR 40.0000). To evaluate compliance with the MCP, DEP conducted a targeted review of **MCP sites** in five (5) Massachusetts cities – Fall River, Worcester, Holyoke, Springfield and Chelsea. These cities were chosen because the Commonwealth of Massachusetts Executive Office of Environmental Affairs (EOEA) has designated some of their neighborhoods as **Environmental Justice (EJ) areas**. Environmental justice is based on the principle that all people have a right to be protected from environmental pollution and to live in and enjoy a clean and healthful environment. Environmental justice areas tend to have a higher than average number of MCP sites than other communities. The average number of MCP sites in cities and towns with EJ areas is over 170, while the average number of MCP sites for cities and towns without EJ areas is 40. This could be attributed to the fact that most EJ areas are located within densely populated areas that often may have high concentrations of industrial and commercial facilities. The entire City of Chelsea is designated as an EJ area

Because children are more likely to experience health problems from environmental **contamination** than adults and most children spend up to half their weekday hours away from home at **school**, DEP focused its evaluation on MCP sites and hazardous waste generators located near schools. The schools that were the focus of this study encompass public and private primary and secondary schools as identified by the Massachusetts Department of Education (MDOE). The location and status of the schools (e.g., open or closed) were verified with the City of Chelsea School Department. *Figure 1* identifies the schools in Chelsea. *Figure 2* identifies all of the MCP sites located within 1000 feet of each school.

DEP evaluated how it might be possible for children or adults to come into contact with or otherwise be exposed to environmental contamination at MCP sites located within 1000 feet of a school. This type of evaluation is called an **exposure pathway assessment**. A key principle of such an assessment is, "no exposure – no risk". The exposure pathways evaluated in this study were:

[1] This report contains terminology that may be new to the readers. With this in mind, **Appendix A** presents definitions for terms commonly used by the Department when implementing the MCP. All words in this report appearing in **bold** typeface are defined or explained in an alphabetical list in Appendix A.

- Ingestion of **contaminated media** (e.g., drinking water, surficial soils) – has contamination at an MCP site impacted a drinking water supply or is there potential for incidental ingestion of contaminated soil?
- Direct contact – is contaminated soil or debris accessible? Can a person unknowingly or otherwise come into contact with contaminated soil or debris? and,
- Inhalation – can contaminated dust or vapors pollute outdoor (ambient) air? Can chemicals somehow affect the indoor air quality of nearby buildings?

Drinking water was eliminated from further review as an exposure pathway of concern because the City of Chelsea receives its drinking water from the Massachusetts Water Resources Authority (MWRA) public water supply system that draws water from the Wachusett and Quabbin Reservoirs. In addition, public water supplies are tested frequently to ensure that the water provided to consumers meets all applicable drinking water standards. The exposure pathway evaluation then focused on MCP sites with releases of the type that could result in impacts to indoor air in nearby schools and homes and sites where people might come into contact with contaminated surficial soil or could be exposed to fugitive dust blowing off-site.

While not within the scope of this evaluation, it should be noted that DEP has several programs that work to promote a "healthy school environment." DEP inspects school asbestos removal projects to ensure that the material is properly contained and disposed. DEP also works with school districts across Massachusetts to reduce exposures to diesel pollutants from idling school buses. Scientific studies indicate that exposure to exhaust from diesel vehicles over time can cause serious health problems. In light of the importance of this matter, DEP has recently conducted numbers of inspections at schools throughout the state, citing several school bus fleet operators for excessive bus idling. DEP has also developed "Best Management Practices for Reducing Diesel Pollution at Schools" for school departments and bus operators. Information about these programs can be obtained at: http://www.mass.gov/dep/.

The remainder of this report provides an explanation of the study methodology and the findings of the exposure pathway assessment and compliance evaluation. The following section provides background information to familiarize the reader with DEP's regulations that apply to MCP sites.

2.0 THE MASSACHUSETTS CONTINGENCY PLAN

This section describes the investigation, cleanup requirements and deadlines applicable to MCP sites evaluated by DEP in this study.

2.1 REGULATORY REQUIREMENTS

The regulations that govern the investigation and cleanup of chemical spills and contaminated property in Massachusetts are known as the Massachusetts Contingency Plan (the MCP; 310 CMR 40.0000). The MCP requires that a party investigating or cleaning up an oil and/or chemical spill or contaminated property (called "MCP sites" in this report) hire a **Licensed Site Professional** (**LSP**) to oversee and direct response actions and that this work be done in compliance with the MCP's performance and cleanup standards. These parties are required to send in various reports to DEP by specific deadlines to prove that they have completed the job in a manner that is protective of public health. DEP **audits** a large number of submittals to verify that the work was done properly and issues violation notices and, when necessary, enforceable orders and penalties to parties who fail to submit investigation and cleanup reports to DEP on time, fail to do work properly or fail to conduct cleanups at all. In certain cases where the responsible parties are either unable or unwilling to take needed actions, DEP can intervene and draw money from the **state "Superfund"** to hire contractors to conduct investigations or perform cleanups.

The MCP describes the steps a person must take to notify DEP of a release of oil and/or hazardous materials and investigate and cleanup environmental contamination in a manner that is protective of public health and the environment. In addition, the MCP lists various types of reports that must be submitted to document that a site has been investigated properly, that certain investigation or cleanup end-points have been reached and that environmental tests prove that a cleanup meets the MCP's requirements to achieve a condition of **no significant risk** to public health, welfare and the environment at the site. The regulations and background information about the MCP cleanup program can be found at http://www.state.ma.us/dep/bwsc/regs.htm.

2.2 MCP PROGRESS REPORTS

The MCP provides numerous opportunities for parties to report on site investigation and cleanup progress. This information is communicated to DEP in a wide variety of reports, each required by specific MCP submittal deadlines.

Preliminary response actions and risk reduction measures are taken soon after contamination is discovered in response to time-critical conditions (releases that pose an unacceptable risk for a short period of time) and may be implemented when necessary at any time during a cleanup. Two types of Preliminary Response Actions reviewed during this study are **Immediate Response Actions** (**IRAs**) and **Utility-related Abatement Measures** (**URAMs**).

The MCP requires parties to conduct IRAs at all sites where a sudden release of oil and/or or hazardous materials above an MCP **Reportable Quantity** occurs or where a time-critical release of oil or hazardous materials is discovered. Examples of sudden releases are fuel spills from truck saddle tanks and ruptured drums or chemical releases as the result of a fire. Time-critical releases include indoor air contamination or contamination of a private drinking water supply well caused by a chemical spill or underground fuel storage tank leak. Once the

immediate exposure problems caused by the IRA condition are controlled, additional response actions may be needed to find the source of the problem and define the nature and extent of the release in order to determine its impact on soil, groundwater and surface water (see "Tier Classification" and "Phase II/III Investigations" below). IRAs are generally approved by DEP and overseen by LSPs. DEP oversees and manages more complex IRA cases. IRA Plans are due within sixty (60) days of notification to DEP of time-critical releases. IRA Status Reports are due four (4) months after the IRA Plan is submitted and every six (6) months thereafter until the IRA is completed and an IRA Completion Statement is filed with the DEP.

When underground utility (water, sewer, electric, etc.) repair or construction work encounters contaminated soil and/or groundwater, the MCP requires that a URAM Plan be submitted to DEP to ensure that the utility work will be conducted under the supervision of an LSP in order to protect the workers and ensure that contaminated media is properly handled. URAM Status Reports are due four (4) months after the URAM Plan is submitted and every six (6) months thereafter until the URAM is completed and an URAM Completion Statement is filed with the DEP.

Completion of Preliminary Response Actions often results in cleanup of the site in less than a year resulting in the submittal to DEP of a closure report (see "Response Action Outcome" below). If a site can not be cleaned up within one year, the MCP has deadlines directing parties to submit progress reports to DEP to show that work is being conducted over time. The following progress reports are due to the DEP in the event that a **Potentially Responsible Party** (PRP) does not close out the site within one (1) year.

- A **Tier Classification** together with a **Phase I Initial Site Investigation Report** must be submitted within one (1) year of release notification (knowledge of contamination). More complicated sites are classified in the MCP as **Tier I** and a permit from DEP is needed in order for a person to conduct response actions. The permit review process allows DEP to check to make sure the work proposed is technically sound and likely to comply with the MCP's performance standards. Less complicated sites are classified **Tier II**. A DEP permit is not needed for work to proceed at a Tier II site. DEP audits submittals for both Tier I and Tier II sites.

- Within two (2) years of the date of Tier Classification, a person doing a cleanup must submit a **Phase II - Comprehensive Site Assessment** and a **Phase III - Identification, Evaluation and Selection of Comprehensive Remedial Action Alternatives Report** to DEP. These reports provide a detailed description of the environmental problem at a site and identify the techniques that will be used to clean the problem up if a cleanup is shown to be necessary, respectively.

- Within three (3) years of the date of Tier Classification, a **Phase IV - Remedial Action Plan** must be submitted to DEP. Remedial Action Plans often describe the treatment system designed to remove contamination from soil or groundwater. A groundwater system typically involves recovery wells pumped to a treatment/filtration system. A soil treatment system extracts contamination in vapor form from soil for treatment. These systems may need to be operated for months or longer (sometimes for years) in order to effectively remove contamination from the environment. Sites with operating treatment systems are in **Phase V** or **Remedy Operation Status (ROS).** System monitoring reports must be submitted to DEP until a condition of no significant risk has been achieved at which point a Response Action Outcome can be submitted.

2.3 SITE CLOSURE REPORT

When a cleanup is complete, a site closure report also known as a **Response Action Outcome** (RAO) must be submitted to DEP by an LSP. An RAO provides information about the investigation of a release and the scientific explanation that supports the conclusion that the release no longer poses a condition of significant risk to public health, safety, welfare or the environment. An RAO can be submitted as soon as a cleanup is completed (the sooner the better). Many cleanups done as IRAs for example finish the job quickly and result in RAOs. However, some cleanups may take years to investigate, understand and clean up due to their complexity.

In order to set limits on how long a cleanup can continue, the MCP contains deadlines by which an RAO and its various supporting documents must be submitted to DEP. The MCP allows up to six (6) years after release notification is made to DEP officials for an RAO to be submitted. It is important to note that, since 1993 when the MCP was revised to allow LSP oversight of response actions, over 20,000 releases of oil and/or hazardous materials have been cleaned up in Massachusetts with 60% of potentially responsible parties submitting an RAO to DEP within one year of release notification and 85% submitting an RAO within three years of release notification.

3.0 EXPOSURE PATHWAY AND COMPLIANCE EVALUATION

This section describes the exposure pathway and compliance evaluation objectives (Section 3.1) and the methodology developed to implement the evaluation (Section 3.2). A discussion of the exposure pathway and compliance evaluation findings is presented in Section 3.3.

3.1 OBJECTIVE

The primary objective of this study was to ensure that MCP sites do not pose risk to children attending school in Chelsea. DEP reviewed the compliance status of all MCP sites located within 1000 feet of eleven (11) Chelsea schools (see schools mapped on *Figure 1*). DEP also evaluated businesses that generate hazardous waste in the same target areas.

Figure 3 shows the location of **Hazardous Waste Generators** located within 1000 feet of a school. Two were evaluated during this project.

Finally, DEP expanded the study beyond the investigation of MCP sites and hazardous waste generators within 1000 feet of a school to include a review of all sites with Response Action Outcome status in Chelsea. A*ppendix F* shows all of the MCP sites with Response Action Outcome status that were audited during this project.

3.2 METHODOLOGY

As previously mentioned, the MCP sites were prioritized based on the exposure pathway evaluation – could chemicals released at a site pose risk to sensitive receptors? Highest priority was given to releases that involved contaminated groundwater that might impact indoor air in nearby schools or homes (see *Appendix D* for more information about this pathway) and sites where people might come into contact with contaminated surficial soil or could be exposed to fugitive dust blowing off-site.

The compliance evaluation was important because containing or removing the contamination associated with a release of oil and/or hazardous materials as quickly as possible reduces the time a sensitive receptor might be exposed to uncontrolled contamination. DEP checked to make sure cleanup reports and RAOs were being provided to DEP in accordance with MCP deadlines. DEP also reviewed the quality of ongoing and completed cleanups in the study area to ensure that the work was technically sound. In some cases, DEP reviewed Response Action Outcomes (RAOs) for releases reported in the 1980's that were cleaned up a number of years ago in order to verify that the work was done properly. DEP also conducted targeted inspections of MCP sites and hazardous waste generators in the study area

The compliance evaluation involved the following tasks:

- The compliance status (the progress of cleanups) for all MCP sites within 1000 feet of the schools was determined. If the response actions were lagging, a more detailed review occurred to determine if the delay was reasonable due to complicated site conditions or other reasons beyond the control of the potentially responsible party. DEP initiated enforcement actions when necessary to get parties back on track.

- The quality of cleanups was evaluated for those sites where response actions were not relatively simple and straightforward. The evaluation focused on releases of an unknown quantity of material and/or where significant soil and/or groundwater contamination had the potential to expose the community to oil and/or hazardous materials rather than simple, straightforward cleanups such as a spill of a known quantity of fuel to a paved surface. This evaluation assessed a wide variety of MCP response actions including time critical response actions (IRAs), comprehensive response actions (Phase II – Phase V) and sites that have been closed out (sites with a RAO submittal).

- DEP reviewed records to identify facilities that generate hazardous waste in the study area to determine if a compliance inspection was warranted. DEP evaluated the nature of the facility and its proximity to a school, the types and quantities of oil and/or hazardous materials used, the past compliance history of the facility, the length of time the facility has been in operation, and if there were known releases at the facility. Using this criteria, two (2) facilities were identified for inspection. If noncompliance was noted during the inspection, the cause of noncompliance was evaluated to determine if it would likely result in a release that could affect the neighboring area.

- Utility Related Abatement Measure (URAM) submittals were reviewed to ensure that URAMs were conducted properly and that the source of the contamination has been identified and the individuals responsible for the cleanup have been notified. Because the party undertaking the URAM is not required to take the site to closure (an RAO), the party responsible for the release discovered during the utility construction must be identified so that a complete cleanup will be conducted in a timely manner.

- Downgradient Property Status (DPS) submittals were evaluated to ensure that the sources of contamination have been identified and the appropriate parties notified of their obligations. DPS submittals are filed at locations where contamination is reported to have migrated onto a property from another neighboring (upgradient) location. As is the case with URAMs, the party filing DPS is not required to take the site to closure (an RAO) and the contamination found may not yet be attributed to a potentially responsible party.

3.3 FINDINGS

The goals of DEP's study were to ensure that school children, a particularly sensitive receptor group, are not exposed to chemicals released from MCP sites and that the parties responsible for cleaning up MCP sites are conducting response actions in accordance with the MCP's performance standards and progress report deadlines.

When violations were found during this evaluation, enforcement action was taken to bring the parties back into compliance. DEP was also prepared to conduct the response actions using its state contractors at any MCP site in noncompliance where DEP determined that: 1) site conditions posed a serious risk to the public and 2) the potentially responsible parties were unwilling or unable to conduct the work quickly. No such incidents of noncompliance were identified in the study area.

DEP identified a total of sixty-four (64) locations where a release of oil or hazardous material had been reported to DEP in Chelsea within 1000 feet of eleven (11) schools [*Table 1*].

3.3.1 Exposure Pathway Evaluation Findings

The exposure pathway evaluation considered the types of chemicals released at a site and whether or not the chemicals impacted soil, groundwater or air quality. The exposure pathway evaluation performed for the study areas revealed the following:

- No sites were found that pose a health risk to nearby residents or school children as a result of a direct contact hazard or airborne dust from surficial soil contamination;
- No site conditions were found that could pose a health risk as a result of indoor air contamination caused by vapor migration from contaminated groundwater into nearby homes or schools; and
- Drinking water is not a potential exposure pathway since Chelsea is served by the MWRA public water supply system.

3.3.2 Audit Findings

As part of this initiative, DEP completed audits and/or other reviews of 44 of the 64 sites within 1000 feet of a school, and 126 other sites throughout the city (170 total) for which an RAO was submitted. Since the entire City of Chelsea is an Environmental Justice area, these additional 126 sites were reviewed to determine the compliance status of sites not captured within the 1000-foot radius of a school. DEP's Bureau of Waste Site Cleanup conducts three types of audits referred to as Level 1, Level 2 and Level 3 based upon the level of effort required for the completion of each audit. Some older sites were reviewed using forms and criteria in place at that time and were not considered Level 1 audits, however, a similar level of review was employed. Some sites were very minor spills and were screened to determine if a Level 1 audit was warranted.

The Level 1 Audit (L1) involves a file review of single response action documentation for a single release. The L1 audit is conducted to provide a preliminary screening review of documentation submitted to DEP using a standardized screening form. The screening helps DEP identify potential time critical conditions requiring DEP action.

The Level 2 Audit (L2**)** is conducted to evaluate specific on-going assessment and remedial response actions at a site or conditional closure of a site (e.g. Remedy Operation Status (ROS) or Activity & Use Limitations, respectively). The L2 audit is considered an "unannounced" audit, and the Responsible Party/Potentially Responsible Party is given a verbal 24-hour notice of the site inspection. A L2 audit includes a focused screening review of the response action being inspected, a site inspection and a Notice of Audit Finding letter.

The most resource intensive audit would be a Level 3 (L3) Audit, which involves a comprehensive review of all response actions completed for a single Release Tracking Number, a site inspection, and completion of a Notice of Audit Finding letter. The L3 Audit is conducted to evaluate response actions at sites to ensure compliance with the MCP.

Of the one hundred and seventy (170) sites in Chelsea that had the status of Response Action Outcome (RAO), DEP conducted Level 1 audits on fifty-two (52) sites and the equivalent on twenty-six (26) others. Seventy-one (71) releases were determined to only warrant a cursory review (pre-screen) because they were either small volume surface spills/vehicular accidents or sites without any nearby sensitive receptors. DEP completed nineteen (19) Level 2 audits in the City and two are pending completion. From the Department's review of these sites, two were recommended for a Level 3 audit which are underway and two were recommend for inspections. The inspections were completed at two sites with an Activity and Use Limitation (AUL). The two sites inspected were both school properties, the Mary C. Burke Complex and the Shurtleff Early Childhood Center. No violations were identified regarding the obligations of the Activity and Use Limitation. An AUL is used to prevent risk to human health by restricting or limiting site activities and uses in areas of the site where residual contamination exists. Further detail of the MCP sites located within 1000 feet of a school are provided in Table 1. A listing of all the sites in Chelsea with Response Action Outcomes that were audited by DEP is provided in Appendix F.

3.3.2 Compliance Evaluation Findings

3.3.2.1 Petroleum Releases

Forty-nine (49) of the sixty-four (64) MCP sites identified in the study areas near schools involved the release of petroleum products to the environment. Petroleum products include gasoline, diesel fuel, and home and heavy commercial grades of heating oil. Thirty-four (34) petroleum releases were related to leaking fuel storage tanks. Ten (10) of the petroleum releases were related to sudden spills.

DEP prioritized the review of leaking fuel storage tanks because long-term fuel storage tank leaks are more likely to result in sites with groundwater contamination and subsequently, potential indoor air quality impacts. Indoor air contamination may occur if **volatile organic compounds** (VOCs) migrate from contaminated groundwater flowing near or under a school building into the structure itself. (See Appendix D for more information regarding the indoor air quality.) The thirty-four (34) petroleum releases related to leaking fuel storage tanks included:

- Twelve (12) sites involving leaking underground fuel storage tanks (USTs);
- Three (3) sites involving leaking above ground storage tanks (ASTs); and
- Nineteen (19) sites involving residual petroleum contamination found in the subsurface soils and/or groundwater. Residual petroleum contamination is usually related to releases from historic petroleum storage tanks that were removed many years ago.

DEP audited each of the thirty-four (34) fuel storage tank related releases and found:

- Cleanup has been completed at twenty-seven (27) sites;
- Five (5) sites are undergoing comprehensive site investigations; and
- Two (2) site have pending enforcement actions against them.

DEP's compliance evaluation of the two (2) sites with pending enforcement actions either had violations for late submittal or incomplete site investigations. Based upon information available and DEP experience, DEP determined that the violations did not result in a health risk to school children or nearby residents.

DEP identified ten (10) locations where sudden petroleum releases occurred. These releases include spills from fuel transfer operations (e.g. overfills), vehicle accidents, etc. Since these releases are sudden and the quantity of each release can be reasonably estimated, there is low likelihood for widespread impact to soil or groundwater. These sites are generally cleaned up quickly and effectively with little residual contamination remaining in the environment and therefore pose low potential for sensitive receptor exposure. DEP's audit of the ten (10) sudden petroleum releases found that cleanup had been completed at all ten (10) releases. None of these releases were found to pose a risk to the school children or nearby residents.

3.3.2.2 Hazardous Materials Releases

The remaining fifteen (15) releases involve hazardous materials (industrial chemicals such as acids, solvents, metals, etc.). These releases resulted in subsurface soil or groundwater contamination that is indicative of long-term leaks from above or underground storage tanks and/or historical dumping. These types of releases usually pose a greater long-term exposure risk than a sudden release of a known quantity, such as a ruptured drum. DEP's review of the fifteen (15) releases found :

- Cleanup has been completed at fourteen (14) sites; and
- One (1) site is undergoing active investigation or remediation.

One (1) release of hazardous materials was related to a sudden spill to the ground surface. This site is the subject of ongoing enforcement actions by DEP.

3.3.2.3 Targeted Review of Response Actions

DEP also conducted a targeted review of response actions at MCP sites within Chelsea. Specifically, the following two types of response actions were evaluated: Utility-related Abatement Measures, and Downgradient Property Status (DPS) submittals.

Utility-related Abatement Measure (URAM) plans were submitted for three (3) locations in the study area when contamination was discovered during utility construction projects. DEP is working to identify the sources of contamination at these locations. None of the releases were found to require an accelerated response action such as an IRA.

A Downgradient Property Status (DPS) submittal was filed for one (1) location where contamination was discovered in the study area. DEP is currently investigating the source of the contamination. The site conditions do not appear to pose risk to school children or nearby residents.

3.3.2.4 Hazardous Waste Generators

Figure 3 identifies all of the hazardous waste generators located within 1000 feet of schools in Chelsea. DEP identified two (2) hazardous waste generators that required evaluation to confirm that waste was being handled, stored and disposed of properly. DEP conducted compliance inspections at these two (2) facilities. No significant violations were found at one facility. The other facility is the subject of ongoing higher-level enforcement due to improper handling and storage of hazardous wastes. However, the site conditions do not appear to pose a risk to school children or nearby residents.

3.3.2.5 Field Assessment and Support Team Investigations

As part of this initiative, DEP's in-house Field Assessment and Support Team (FAST) was utilized to try and obtain groundwater samples from various properties within Chelsea. FAST installed driven wellpoints at both of the properties listed below:

- **Former Prattville Machine Company,144 Beech Street (3-17916)--**DEP identified one MCP site (3-19299), 203-211 Everett Avenue, located within 1000 feet of Chelsea High School that filed for Downgradient Property Status (DPS). DEP's Field Assessment and Support Team tried to identify the source of contamination detected. FAST performed a limited investigation at the Former Prattville Machine site, 144 Beech Street (3-17916), which is located adjacent to and hydrogeologically upgradient of the property that filed for DPS. The DPS was filed for groundwater contaminated with volatile organic compounds (VOCs), specifically the chlorinated compounds trichloroethylene and vinyl chloride. The 144 Beech Street property was formerly a machine shop and is now owned by the City of Chelsea. A Request for Access letter was sent to the City of Chelsea, and access to the property was granted. FAST installed three, small-diameter driven wellpoints at the property, however, due to the presence of tight clay in the subsurface, groundwater did not recharge in sufficient quantity to collect samples for analysis. In order to determine contaminant conditions at the 144 Beech Street property, DEP audited the January 2000 assessment report and Response Action Outcome statement prepared by Nagle Consulting Associates, Inc. (Nagle) on behalf of the Prattville Machine Company. A reportable condition for chlorinated VOCs was not identified at 144 Beech Street during a 1999 soil and groundwater assessment program. Based on this data, the direction of groundwater flow, and the distance between the site and the school, it is unlikely that this site is posing a risk to indoor air at the Chelsea High School. The source of the VOCs on the 203-211 Everett Avenue property, for which the DPS was submitted, has yet to be identified.

- **Glyptal Inc., 305 Eastern Avenue (3-23706**)--FAST conducted a limited subsurface investigation at a large quantity generator facility, Glyptal Inc. (Glyptal), 305 Eastern Avenue (3-23706). The Glyptal facility is located approximately 700 feet south of the Mary Burke Elementary School Complex. Enforcement actions have been initiated by DEP against Glyptal for the improper storage and handling of hazardous wastes (see Section 3.4 above). On June 15, 2004, EBI Consulting submitted a Class A-1 Response Action Outcome Statement on behalf of Glyptal, which outlined various actions completed at the facility to address the "threat of release" conditions from improperly stored drums and chemical waste management issues. Soil and groundwater assessment work was not included in the environmental assessment actions performed at the site. Therefore, between January and April 2005, FAST installed five driven wellpoints in the drum storage areas. Groundwater samples were collected and screened for volatile organic compounds (VOCs) at DEP's regional laboratory and for total petroleum hydrocarbon/oil identification (TPH/Oil ID) at the Wall Experiment Station (Wall). Results of the VOC screening identified low microgram per liter (ug/l) concentrations of petroleum compounds in shallow groundwater at the eastern portion of the Glyptal site. Results of Wall's TPH/Oil ID analysis reported total petroleum and aromatic hydrocarbons at levels below their applicable DEP standards (see Appendix E for a complete summary of analytical data). Based on this information, it is unlikely that this site is posing a risk to indoor air at the nearby elementary school complex.

3.3.2.6 Brownfields

DEP is committed to the cleanup and redevelopment of Brownfields properties as a way to stimulate the economy and promote environmental protection goals. EPA defines Brownfields as “real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant.” While there is no formal definition of the term "Brownfields" in Massachusetts, these properties often have certain characteristics in common: they are typically abandoned or for sale or lease; they typically have been used for commercial or industrial purposes; and they may have been reported to DEP because contamination has been found.

BWSC/NERO has dedicated staff to promote Brownfields redevelopment in a variety of ways, including providing technical and regulatory assistance to municipalities, redevelopment authorities, community development corporations, and private developers. Information about the MCP cleanup process, liability provisions of c.21E, funding, and site-specific information is provided to these parties. Such facilitation is currently being provided to a private developer on the following site in Chelsea:

- **Former Forbes Lithographic, 1 Forbes St., Chelsea (RTN 3-1755 & #3-24402):** On January 4, 2005, BWSC NERO and Boston met with developer, Davis Design Development, their legal counsel, and their LSP to discuss a proposed Brownfields redevelopment effort for the site and issues related to site contamination. This old, under-utilized industrial site is located within an Environmental Justice area along the Chelsea River and Mill Creek. The redevelopment proposal consists of mainly residential, some commercial, and possibly marine use with open space, utilizing "green" construction technology, and a proposed commuter rail stop. Davis Design Development is currently negotiating a purchase and sales agreement with the current owner. The licensed site professional has requested DEP’s Bureau of Waste Site Cleanup review and comment on their draft Phase II Report in an effort to assist the developer in providing assurance to their lending institution on the progress of the project, as additional funds are needed.

For more information about DEP’s Brownfield Program, see the following web site: http://www.mass.gov/dep/bwsc/brownfld.htm

3.3.3 DEP Enforcement Actions

DEP regularly tracks potentially responsible parties’ compliance with submittal deadlines and “triages” the quality of report submittals, particularly those related to IRAs, Tier Classification, Phase V/ROS and RAO. In addition, through both systematic and random selection processes, DEP conducts comprehensive technical audits and compliance reviews of the a large number of Response Action Outcomes (RAOs) each year to ensure that response actions were done properly and that public health and the environment was protected.

As a result of DEP’s regular auditing and compliance review processes, enforcement actions had previously been taken at a number of sites in Chelsea before this study began. Enforcement actions had previously been taken by DEP for twenty-one (21) of the sites (33%) in the study area prior to the initiation of this study. Enforcement actions included Notices of Noncompliance (NONs) in which enforceable deadlines were set by which potentially responsible parties were required to correct violations.

As a result of this project, DEP initiated enforcement actions at ten (10) MCP sites within 1000 feet of schools (16%) where noncompliance was identified. Ten (10) NONs were issued due to missed submittal deadlines. Five (5) of these locations have returned to compliance. Enforcement actions are ongoing at the remaining noncompliant sites. DEP has reviewed the five (5) remaining noncompliant sites within 1000 feet of schools, and has determined that they are unlikely to impact the schools. Higher level enforcement actions are being pursued against Glyptal, Incorporated, one of the hazardous waste generator facilities inspected as part of this study. Although noncompliance was found in these cases, conditions at these sites did not indicate that school children or nearby residents are at risk.

DEP's routine auditing and compliance evaluation processes, as well as targeted compliance evaluations like this study, help ensure that the cleanups being conducted by the private sector are protective of public health and the environment and that the small percentage of parties missing MCP deadlines or not conducting work properly return to compliance.

4.0 CONCLUSIONS

DEP conducted a targeted exposure potential and compliance evaluation of MCP sites and facilities that generate hazardous waste in the City of Chelsea to determine if they have the potential to adversely impact the health, safety and welfare of school children, a particularly sensitive receptor group. DEP evaluated all response actions conducted at MCP sites located within 1000 feet of Chelsea schools. In addition, since the entire City of Chelsea is an Environmental Justice area, DEP evaluated all Response Action Outcome statements submitted for MCP sites in Chelsea. The MCP sites in the study area were prioritized based on the likelihood that soil or groundwater contamination might pose risk to children. Highest priority was given to releases that could impact indoor air in nearby schools or homes and sites where children might come into contact with contaminated surficial soil or could be exposed to fugitive dust blowing off-site.

The exposure pathway and compliance evaluations determined that school children and residents within the study areas are not exposed to oil and/or hazardous materials from MCP sites or facilities that generate hazardous waste. The compliance evaluation also found that the majority of potentially responsible parties were conducting response actions in accordance with the MCP's performance standards and progress report deadlines.

Although DEP found ten (10) MCP sites in noncompliance with the Massachusetts Contingency Plan and/or other relevant environmental regulations during this study, based upon available information, DEP found that there were no documented instances where noncompliance has resulted in school children, residents, workers, and visitors being exposed to oil and/or hazardous materials from these sites. Further, when violations were found during this evaluation, enforcement action was taken by DEP to bring the parties back into compliance.

DEP is committed to ensure the protection of the Commonwealth's public health, welfare, safety and environment. DEP will continue to audit response actions at MCP sites and take enforcement actions when necessary to ensure that contamination is cleaned up properly and on time in Fall River and across Massachusetts.

The findings and conclusions stated in this report are based upon information available to DEP at the time this report was prepared. DEP's statements do not represent DEP regulatory approval under the Massachusetts Contingency Plan (the MCP; 310 CMR 40.0000) of response actions conducted at any site, property or location listed in this report. DEP reserves the right to require response actions under the MCP at any property or location listed in this report should information become available that indicates such response actions are warranted. DEP also reserves the right to initiate appropriate enforcement actions to achieve compliance with the MCP should such actions be found to be necessary.

Appendix A

Figures

FIGURE 1

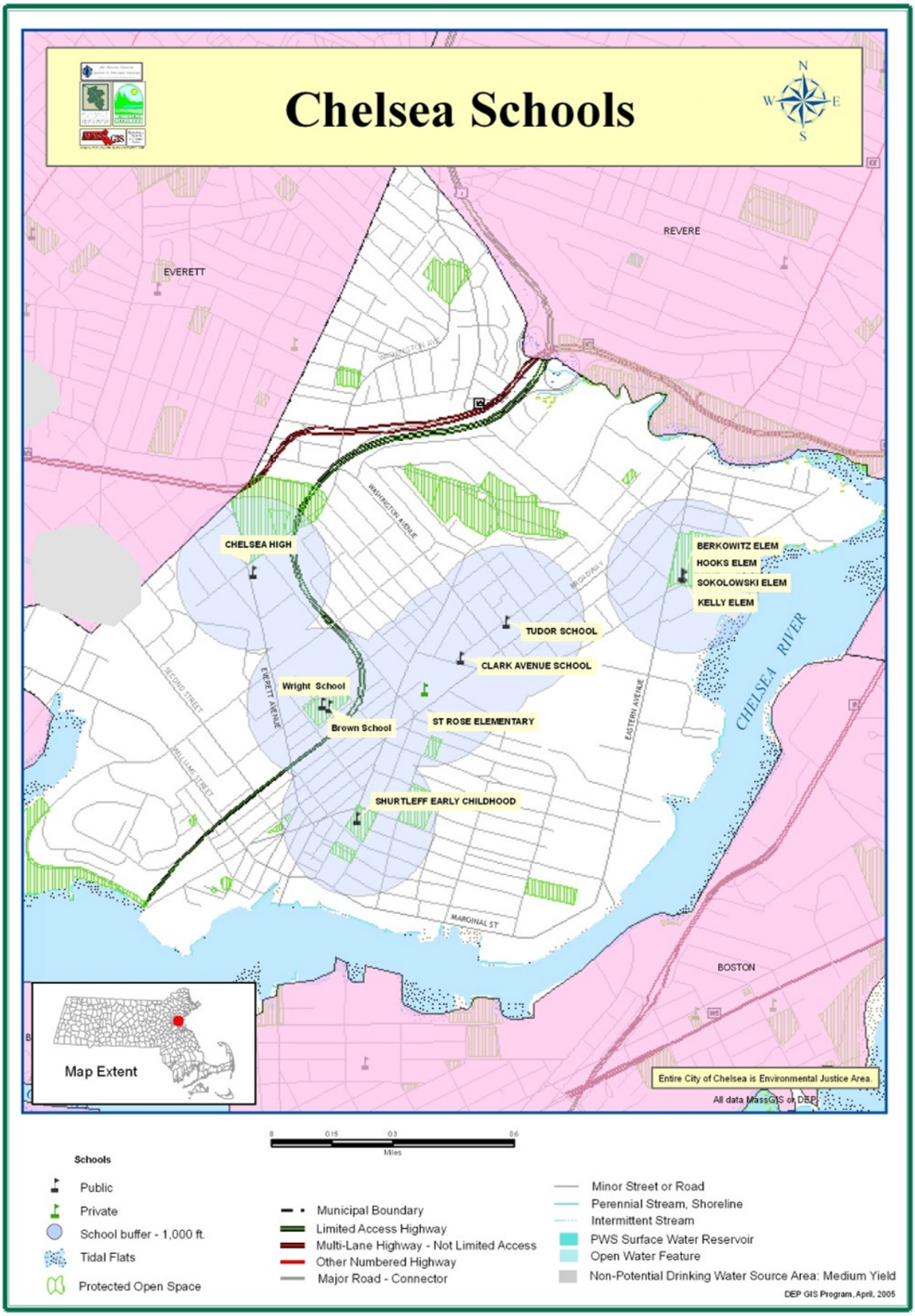

Chelsea Schools
N
W
E
S
REVERE
EVERETT
CHELSEA HIGH
BERKOWITZ ELEM
HOOKS ELEM
SOKOLOWSKI ELEM
KELLY ELEM
TUDOR SCHOOL
CLARK AVENUE SCHOOL
Wright School
Brown School
ST ROSE ELEMENTARY
SHURTLEFF EARLY CHILDHOOD
CHELSEA RIVER
BOSTON
MARGINAL ST
EASTERN AVENUE
EVERETT AVENUE
SECOND STREET
WILLIAMS STREET
WASHINGTON AVENUE
BROADWAY
Map Extent
Entire City of Chelsea is Environmental Justice Area.
All data MassGIS or DEP
0 0.15 0.3 0.6
Miles
Schools
Public
Private
School buffer - 1,000 ft.
Tidal Flats
Protected Open Space
Municipal Boundary
Limited Access Highway
Multi-Lane Highway - Not Limited Access
Other Numbered Highway
Major Road - Connector
Minor Street or Road
Perennial Stream, Shoreline
Intermittent Stream
PWS Surface Water Reservoir
Open Water Feature
Non-Potential Drinking Water Source Area: Medium Yield
DEP GIS Program, April, 2005

FIGURE 2

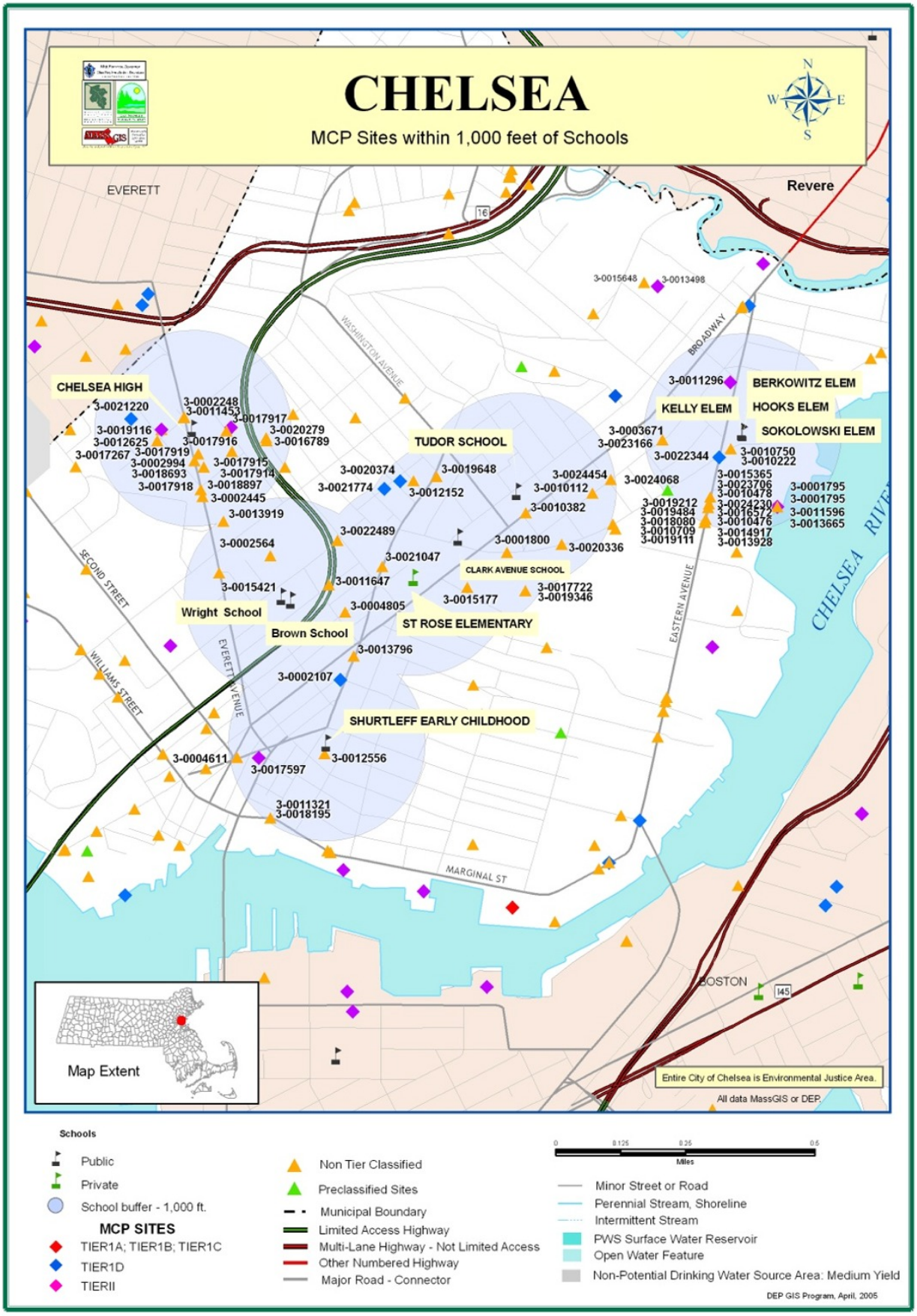
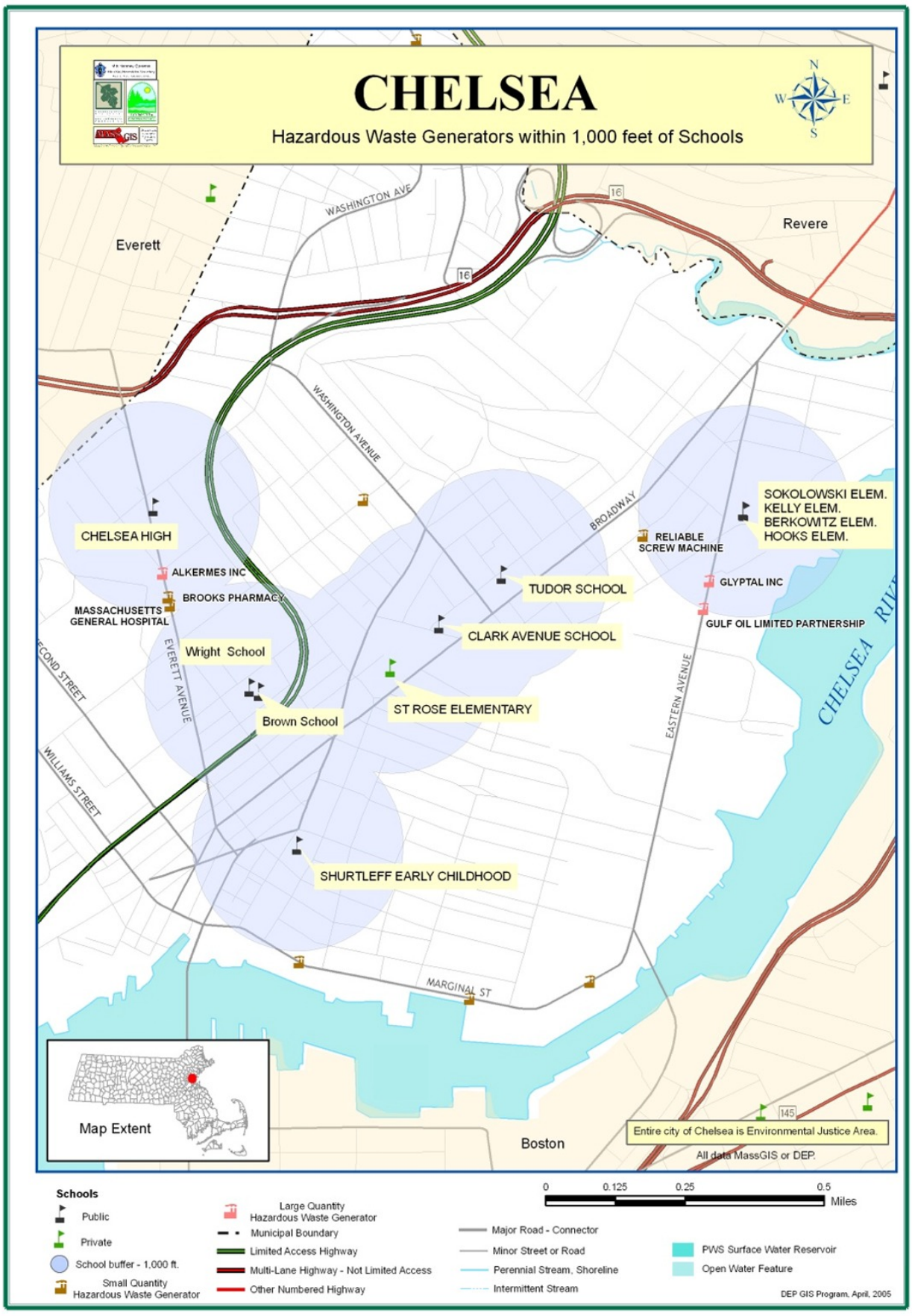

CHELSEA
MCP Sites within 1,000 feet of Schools
EVERETT
Revere
BOSTON
CHELSEA RIVER
CHELSEA HIGH
TUDOR SCHOOL
BERKOWITZ ELEM
KELLY ELEM
HOOKS ELEM
SOKOLOWSKI ELEM
CLARK AVENUE SCHOOL
Wright School
Brown School
ST ROSE ELEMENTARY
SHURTLEFF EARLY CHILDHOOD
WASHINGTON AVENUE
BROADWAY
SECOND STREET
EVERETT AVENUE
EASTERN AVENUE
WILLIAMS STREET
MARGINAL ST
Map Extent
Entire City of Chelsea is Environmental Justice Area.
All data MassGIS or DEP.
Schools
Public
Private
School buffer - 1,000 ft.
MCP SITES
TIER1A; TIER1B; TIER1C
TIER1D
TIERII
Non Tier Classified
Preclassified Sites
Municipal Boundary
Limited Access Highway
Multi-Lane Highway - Not Limited Access
Other Numbered Highway
Major Road - Connector
Miles
Minor Street or Road
Perennial Stream, Shoreline
Intermittent Stream
PWS Surface Water Reservoir
Open Water Feature
Non-Potential Drinking Water Source Area: Medium Yield
DEP GIS Program, April, 2005

FIGURE 3


CHELSEA
Hazardous Waste Generators within 1,000 feet of Schools
N
W
E
S
Everett
Revere
WASHINGTON AVE
16
WASHINGTON AVENUE
BROADWAY
CHELSEA HIGH
ALKERMES INC
BROOKS PHARMACY
MASSACHUSETTS GENERAL HOSPITAL
Wright School
Brown School
TUDOR SCHOOL
CLARK AVENUE SCHOOL
ST ROSE ELEMENTARY
SHURTLEFF EARLY CHILDHOOD
SOKOLOWSKI ELEM.
KELLY ELEM.
BERKOWITZ ELEM.
HOOKS ELEM.
RELIABLE SCREW MACHINE
GLYPTAL INC
GULF OIL LIMITED PARTNERSHIP
EVERETT AVENUE
EASTERN AVENUE
SECOND STREET
WILLIAMS STREET
MARGINAL ST
CHELSEA RIVER
Boston
145
Map Extent
Entire city of Chelsea is Environmental Justice Area.
All data MassGIS or DEP.
0
0.125
0.25
0.5
Miles
Schools
Public
Private
School buffer - 1,000 ft.
Small Quantity Hazardous Waste Generator
Large Quantity Hazardous Waste Generator
Municipal Boundary
Limited Access Highway
Multi-Lane Highway - Not Limited Access
Other Numbered Highway
Major Road - Connector
Minor Street or Road
Perennial Stream, Shoreline
Intermittent Stream
PWS Surface Water Reservoir
Open Water Feature
DEP GIS Program, April, 2005

Appendix B

Table

TABLE 1

Compliance Status of MCP Sites Located Within 1000 Feet of City of Chelsea Schools[1]

Key to terms used in this table:

AST: aboveground storage tank

AUL: Activity and Use Limitation

RAO: Response Action Outcome

Class A-1 (A1): Permanent Solution, contamination reduced to background or threat of release eliminated

Class A-2 (A2): Permanent Solution, contamination not reduced to background, AUL not necessary.

Class A-3 (A3): Permanent Solution, contamination not reduced to background, AUL necessary to maintain a level of No Significant Risk.

Class A-4 (A4): Permanent Solution, contamination not reduced to background, AUL necessary to maintain a level of No Significant Risk, soil contamination exceeding Upper Concentration Limits exists either beneath an engineered barrier or at a depth of greater than 15 feet.

Class B-1 (B1): remedial actions not necessary and no AUL is necessary to ensure a level of No Significant Risk.

Class B-2 (B2): remedial actions not conducted, but an AUL is necessary to ensure a level of No Significant Risk.

RTN: a "Release Tracking Number" is assigned to releases reported to DEP for tracking purposes.

UST: underground storage tank

URAM: Utility Release Abatement Measure

Status: This column lists the MCP status for each site. See Section 2 for the definitions of each status type.

L1: Level 1 audit (See Section 3.3 for the definitions of each audit type)
L2: Level 2 audit
L3: Level 3 audit

(1) Only schools with MCP Sites within 1000 feet are included in this table. Some properties have more than one RTN indicating more than one release has been reported on the property.

Alphabetical By School Name

Mary C. Burke Complex-300 Crescent Avenue (William A. Berkowitz Elementary, George D. Kelly Elementary, Edgar A. Hooks Elementary, Frank M. Sokolowski Elementary)

RTN	*Site Name*	*Street Address*	*Reporting Condition*	*Status*	*DEP Action / Determination*	*Receptors at risk?*
3-22344	Crescent and Eastern Ave.	Crescent Avenue	Petroleum contaminated soil	URAM	DEP screening determined that cleanup was adequate and release is unlikely to impact school	NO
3-24068	NSTAR #445 Transformer	Crescent Ave./ Villa St	NON-PCB transformer oil to soil	RAO	L1 DEP audit determined no major noncompliance & no follow-up necessary	NO
3-10750	Parcel 1,2,4 & 5 Chelsea Elementary School	315 Crescent Street	TPH in soil, fuel oil release	RAO with AUL	L3 DEP audit determined no major noncompliance & no follow-up necessary	NO
3-10222	Vacant lot Chelsea Elementary School	315 Crescent Avenue	UST-Petroleum in soil	RAO with AUL	L3 DEP audit determined no major noncompliance & no follow-up necessary	NO
3-24230	Chelsea Terminal	281 Eastern Avenue	Petroleum on groundwater	Unclassified	DEP screening determined that release is unlikely to impact school	NO
3-16572	Gulf Oil Terminal	281 Eastern Avenue	Gasoline to containment structure	RAO A2	DEP screening determined no major noncompliance & no follow-up necessary	NO
3-10476	Gulf Terminal-Chelsea Creek	281 Eastern Avenue	Petroleum sheen on surface water	RAO A1	ER/USCG response. DEP screening determine that release will not impact school	NO
3-14917	Gulf Oil Terminal	281 Eastern Avenue	Petroleum to diked area	RAO Not Required	DEP screening determined that release is unlikely to impact school	NO
3-13928	Gulf Oil Terminal	281 Eastern Avenue	Petroleum in soil	RAO Not Required	DEP screening determined that release is unlikely to impact school	NO
3-19484	Gulf Oil Terminal	281 Eastern Avenue	Gasoline to containment structure	RAO A2	DEP screening determined that release is unlikely to impact school	NO

3-18080	Gulf Oil Terminal	281 Eastern Avenue	Jet fuel to soil	RAONR	DEP screening determined that release is unlikely to impact school	NO
3-10709	Gulf Oil Terminal	281 Eastern Avenue	Gasoline to dike containment	RAO A1	DEP screening determined no major noncompliance & no follow-up necessary	NO
3-19111	No Location Aid	284 Eastern Avenue	Motor oil to pavement in concrete enclosure	RAO A1	L1 DEP audit determined no major noncompliance & no follow-up necessary	NO
3-10478	No Location Aid	284 Eastern Avenue	Petroleum to soil	RAO	DEP screening determined that release is unlikely to impact school	NO
3-1795	Glenmor Oil Co.	295 Eastern Avenue	Petroleum contaminated soil	RAO with AUL	L1 DEP audit determined no major noncompliance & no follow-up necessary	NO
3-11596	Glenmor Oil Co.	295 Eastern Avenue	Petroleum contaminated soil	Tier II	DEP screening determined that release is unlikely to impact school	NO
3-13665	Glenmor Oil Co.	295 Eastern Avenue	Petroleum product on groundwater	Tier II	DEP screening determined that release is unlikely to impact school	NO
3-15365	Glenmor Oil Co.	295 Eastern Avenue	Petroleum to pavement	RAO A1	DEP screening determined that release is unlikely to impact school	NO
3-19212	Crescent Avenue	298 Eastern Avenue	Metals in soil	RAO with AUL	L1DEP audit determined no major noncompliance & no follow-up necessary	NO
3-23706	Glyptal Inc.	305 Eastern Avenue	Drums of paints and solvents	RAO A1	ER oversight, FAST investigation completed, ongoing enforcement case	NO
3-11296	No Location Aid	412 Eastern Avenue	Leaking petroleum USTs	Tier II	DEP screening determined that release is unlikely to impact school, Prior DEP enforcement case	NO
3-23166	No Location Aid	181 Spencer Avenue	UST #4 oil to soil	RAO A2	L1 DEP audit determined no major noncompliance & no follow-up necessary	NO

3-003671	EMTEX	181 Spencer Avenue	Petroleum in groundwater and soil from a drywell	RAO Equivalent	DEP screening determined no major noncompliance, but limited documentation.	NO
Chelsea High School: 299 Everett Avenue						
RTN	*Site Name*	*Street Address*	*Reporting Condition*	*Status*	*DEP Action / Determination*	*Receptors at risk?*
3-17916	Former Prattville Machine Co.	144 Beech Street	PAHs in soil	RAO B1	L1 DEP audit determined no major noncompliance & no follow-up necessary	NO
3-17917	Former Lawrence Metals Company.	145-155 Beech Street	Lead, PCBs in soil	Tier II	DEP screening determined that release was unlikely to impact school due to fencing & proposed engineered barrier	NO
3-13919	Spruce Street	151 Everett Avenue	TPH, VOCs in soil VOCs in groundwater	RAO with AUL	L3 DEP audit determined that cleanup was adequate	NO
3-17918	Intersection w/Maple Street	177 Everett Avenue	PAHs, Lead in soil	RAO B1	DEP screening determined that release was unlikely to impact school	NO
3-18897	No Location Aid	190 Everett Avenue	#2 Fuel oil in groundwater	RAO A2	DEP screening determined that release was unlikely to impact school	NO
3-2445	NASCO Inc.	190 Everett Avenue	Drums of waste oil	RAO A2	L1 DEP audit determined no major noncompliance, but minimal information	NO
3-19299	Next to Floramo's Restaurant	203-211 Everett Avenue	Chlorinated VOCs in soil and groundwater	DPS	Source yet to be identified. DEP screening determined that release was unlikely to impact school	NO
3-18693	Maple Street	211 Everett Avenue	EPH, PAH in soil	RAO	DEP screening determined that release was unlikely to impact school	NO
3-17919	No Location Aid	211 Everett Avenue	EPH, PAH in soil	RAO	L3 DEP audit determined that cleanup was adequate Prior enforcement case	NO

3-2248	BP Gasoline Station	251 Everett Avenue	UST Petroleum to soil	RAO A2	L3 DEP screening determined no major noncompliance & no follow-up necessary	NO
3-11453	Memorial Stadium (High School)	281 Everett Avenue	UST #2 fuel in groundwater	RAO A2	L1 DEP audit determined no major noncompliance & no follow-up necessary	NO
3-17914	Intersection with Maple Street	203 Everett Avenue	Metals , PAHs in soil	RAO	DEP screening determined that release is unlikely to impact school. Prior enforcement case.	NO
3-16789	No Location Aid	201 Maple Street	UST gasoline in soil	RAO A2	L1 DEP audit determined no major noncompliance & no follow-up necessary	NO
3-20279	No Location Aid	204 Maple Street	PCBs, Metals in soil	RAO B1	DEP screening determined that release is unlikely to impact school	NO
3-17915	Intersection with Beech St.	204 Maple Street	EPH, PAH in soil	RAO B1	L3 DEP audit determined that release was unlikely to impact school	NO
3-21220	Near Everett Ave. Intersection	Vale Street	PAH, Lead contaminated soil	URAM	DEP screening determined that release is unlikely to impact school	NO
3-19116/ 3-17267	North of Intersection	Vale Street and Carter Street	PAH, TPH, EPH, VOCs in soil/TPH in groundwater	Tier II	DEP screening determined that release was unlikely to impact school	NO

Clark Avenue School: 8 Clark Avenue

RTN	*Site Name*	*Street Address*	*Reporting Condition*	*Status*	*DEP Action / Determination*	*Receptors at risk?*
3-20374	Eden Street	22 Addison Street	AST #2 fuel oil	Tier ID	DEP screening determined that release is unlikely to impact school, ongoing enforcement case	

3-1800	Joseph Botti Co.	102 Crescent Avenue	TPH, PAHs in soil	RAO A1	DEP screening determined no major noncompliance & no follow-up necessary	NO
3-21774	No Location Aid	Eden Street	Petroleum contaminated soil	URAM	L3 DEP audit determined that release was unlikely to impact school	NO
3-19346	No Location Aid	2 Griffin Way	PAHs, TPH, Metals in soil	RAONR	DEP screening determined that release is unlikely to impact school	NO
3-17722	No Location Aid	2 Griffin Way	PAHs, TPH, Metals in soil & groundwater	RAO with AUL	L1/L2 DEP audit determined no major noncompliance & no follow-up necessary	NO
3-12152	Residence	11 Orange Street	AST #2 fuel oil	RAO A1	ER oversight; no follow-up necessary	NO
Saint Rose Elementary: 580 Broadway						
3-15177	Standard Box Company	28 Gerrish Avenue	EPH & PAH in soil	RAO A2	L1 DEP audit determined no major noncompliance & no follow-up necessary	NO
3-21047	Vacant lot	63 Washington Avenue	Lead in soil	RAO with AUL	L1 DEP audit determined no major noncompliance & no follow-up necessary	NO
Tudor Hill School: 49 Clark Avenue						
RTN	*Site Name*	*Street Address*	*Reporting Condition*	*Status*	*DEP Action / Determination*	*Receptors at risk?*
3-10382	Residence	721 Broadway	AST #2 Fuel oil in basement	RAO A2	DEP screening determined no major noncompliance & no follow-up necessary	NO
3-20336	Parking Lot	151 Crescent Avenue	UST-Gasoline, Diesel fuel in soil	RAO A2	L1 DEP audit determined no major noncompliance & no follow-up necessary	NO
3-10112	No Location Aid	90 Spencer Ave	#2 Fuel oil in soil	RAO A3 with AUL	L3 DEP audit in progress.	NO

3-24454	Chelsea Armory LLC	113 Spencer Avenue	UST #2 Fuel oil in soil	RAO	L1 DEP audit determined no major noncompliance & no follow-up necessary	NO
3-19648	Former Gasoline Station	141-145 Washington St.	UST-EPH, VPH in groundwater	RAO A2	L3 DEP audit determined that cleanup was adequate	NO
Shurtleff Early Childhood: 99 Hawthorne Street						
RTN	*Site Name*	*Street Address*	*Reporting Condition*	*Status*	*DEP Action / Determination*	*Receptors at risk?*
3-12556	Shurtleff School	76 Congress Ave.	TPH and Lead in soil	RAO B1	L1 DEP audit determined no major noncompliance & no follow-up necessary	NO
3-2107	C & C Oil	148 Hawthorne Street	UST removal petroleum contaminated soil	Tier ID	DEP screening determined that release is unlikely to impact school, ongoing enforcement case	NO
3-13796	Fmr. Post Office	175 Hawthorne Street	Fuel oil on groundwater	RAO B1	DEP screening determined no major noncompliance & no follow-up necessary	NO
3-11321	M/V MILTA	37 Marginal Street	Fuel oil sheen in soil & on surface water	RAO A1	Small volume shop spill, no need to screen	NO
3-18195	Eastern Minerals Salt Dock	37 Marginal Street	Hydraulic oil sheen on surface water	RAO A1	ER oversight; no follow-up necessary	NO
3-17597	Greg's Service Station	51 Park Street	UST-Petroleum in soil and #2 fuel oil in groundwater	RAO A2	L1 DEP audit determined non major noncompliance & no follow-up necessary	NO
3-4611	Auto Dealership Fmr.	101 Park Street	UST removal TPH in soil	Tier II	L3 DEP audit determined that release was unlikely to impact school. Ongoing enforcement case	NO

Williams Jr. High School Complex: 180 Walnut Street (Joseph A. Browne School and Eugene Wright School)

RTN	*Site Name*	*Street Address*	*Reporting Condition*	*Status*	*DEP Action / Determination*	*Receptors at risk?*
3-22489	No Location Aid	214 Arlington Street	VPH, Lead in soil	RAO B2 with AUL	L1 DEP audit determined no major noncompliance & no follow-up necessary	NO
3-15421	No Location Aid	99 Everett Avenue	Hydraulic fluid in soil	RAO A2	DEP screening determined no major noncompliance & no follow-up necessary	NO
3-2564	Property	140-180 Spruce Street	Lead in soil, Low levels of VOCs in groundwater	RAOEQ	DEP screening determined that release is unlikely to impact school, Previous enforcement case	NO
3-11647	Williams School	170-180 Walnut Street	Lead, TPH, PAH in soil	RAO A3 with AUL	L1/L2 DEP audit determined no major noncompliance, but AUL corrections were required	NO

Appendix C

Definitions

APPENDIX C – DEFINITIONS

This section contains the definition for terms used in this report that readers may not be familiar with. A comprehensive overview of the Massachusetts Contingency Plan, 310 CMR 40.0000, and Department and Bureau of Waste Site Cleanup operations can be obtained at DEP's web page - http://www.mass.gov/dep/dephome.htm

Audits: Sites that are not actively overseen by DEP are subject to audit by the agency. In general, DEP may conduct a *random audit* of a Response Action Outcome statement within 2 years of filing, or, where evidence exists indicating a potential problem with a site or filing, a *targeted audit* of a Response Action Outcome statement within 5 years of filing. Unless and until a site/submittal is audited by the agency and found to be in noncompliance, the opinions/findings of the Licensed Site Professional are considered to be valid and complete.

Contaminated media – This term includes contaminated groundwater, sediments, soil and/or surface water.

Contamination – This "catchall" term includes materials regulated by the MCP (oil, hazardous materials and hazardous waste). The study **DID NOT** review the impact of other potential environmental contaminants such as lead and/or copper in drinking water, asbestos and laboratory chemicals. Other programs address these items and information about the State's Healthy Schools program can be found at the following web sites: http://www.mphaweb.org/pol_schools_healthyschools.html and http://www.state.ma.us/dph/beha/iaq/schools/schools.htm.

Downgradient Property Status (DPS) – DEP recognizes that people whose property has been affected by contamination from an upgradient or upstream source may not be able to meet the requirements of the MCP because they do not control the source of contamination. Downgradient Property Status provisions allow people in this circumstance to provide DEP with information showing that contamination on their property is coming from an upgradient property. Once this information (called a "Downgradient Property Status Submittal") is filed in accordance with the MCP, the Downgradient Property Status becomes effective and DEP suspends the deadlines for certain submittals and fees.

Environmental Justice (EJ) - The EJ Policy, developed by the Massachusetts Executive Office of Environmental Affairs, directs state resources to serve the high minority, non-English speaking and low-income neighborhoods across the state. These resources ensure that EJ populations have a strong voice in environmental decision-making, receive the full protection afforded them through existing environmental rules and regulations, and increase access to investments that enhance quality of life in these communities by restoring degraded natural resources, enhancing open space and building the urban park network. Environmental justice is based on the principle that all people have a right to be protected from environmental pollution and to live in and enjoy a clean and healthful environment. Environmental justice is the equal protection and meaningful involvement of all people with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies and the equitable distribution of environmental benefits. Maps showing EJ areas in Massachusetts can be found at http://www.mass.gov/mgis/ej.htm.

Exposure Pathway – The mechanism by which human or environmental receptors inhale, consume, absorb, or otherwise take in oil and/or hazardous material at an **exposure point**.

Exposure Point – A location of potential contact between a human or environmental receptor and a release of oil and/or hazardous material. An exposure point may describe an area or zone of potential exposure, as well as a discrete point.

Hazardous Waste Generators – The study reviewed the compliance status of businesses and facilities that generate, store, treat, or dispose of hazardous waste. Information about DEP's Hazardous Waste program can be found at http://www.mass.gov/dep/bwp/dhm/dhmpubs.htm

Immediate Response Action (IRA)- An IRA is an early risk reduction measure required to be conducted at any site when certain time-critical conditions are present, such as a sudden spill or the a potential imminent hazard.

Licensed Site Professionals (LSP) – LSPs are professionals with considerable experience in the field of MCP site assessment and cleanup, including removal actions. An LSP issues "Waste Site Cleanup Activity Opinions" describing whether contamination is present at a site, what work is needed to clean up any contamination found, and whether that work has been completed in accordance with the MCP. These opinions are based on field assessment, sampling, and careful study of a site. The Licensed Site Professional Board of Registration is independent of DEP. The Board determines whether a person applying for an LSP license meets the licensing qualifications, administers a licensing exam, issues licenses, ensures that LSPs meet requirements for continuing education, and disciplines individuals who do not uphold professional standards. DEP audits LSP Opinions to ensure that the work conducted which led to the Opinion complies with environmental laws and regulations. More information is available by contacting the LSP Board at (617) 556-1091 or visiting its website at http://www.state.ma.us/lsp/. Most LSPs are also members of the LSP Association. Visit its website at http://www.lspa.org/index.html.

Massachusetts Contingency Plan (MCP) – The Bureau of Waste Site Cleanup (BWSC) is responsible for implementing the MCP, 310 CMR 40.0000. The MCP contains the regulations for the notification, assessment and cleanup of releases to the environment of oil and/or hazardous materials. The regulations are codified in M.G.L. Chapter 21E (c.21E), the Massachusetts Oil and Hazardous Materials Release, Prevention and Response Act (the Statute). The Bureau of Waste Site Cleanup (BWSC) is responsible for implementing the MCP. The regulations and background information about the MCP cleanup program can be found at: http://www.state.ma.us/dep/bwsc/regs.htm

MCP site – This is a location where a release (e.g., leak, spill or discharge) of oil and/or hazardous materials has occurred in a quantity or at a concentration in soil or groundwater that requires reporting to DEP.

No Significant Risk – This is the standard used for determining when a cleanup is complete. A risk assessment is used to characterize the risk associated with an MCP site and determine if a condition of No Significant Risk to human health, safety, public welfare and the environment exists at the site or has been achieved after an environmental cleanup has been completed. Once this condition is achieved, response actions are finished and a Response Action Outcome (RAO) can be filed.

Phase II Comprehensive Site Assessment Report (Phase II) - A Phase II is a comprehensive site evaluation of the nature and extent of the contamination at the site. The Phase II also evaluates the magnitude of the risk posed by the contamination at the site.

Phase III Identification, Evaluation and Selection of Comprehensive Remedial Action Alternatives Report (Phase III) - A Phase III presents the evaluation of feasible clean up options if a Phase II concludes that a cleanup is necessary.

Phase IV Report Remedial Action Plan (Phase IV)- The Phase IV report contains the detailed design and construction plans for remedial systems and a schedule for the cleanup work.

Potentially Responsible Party - A person who is potentially liable for a release of oil and/or hazardous material and is required to conduct response actions.

Release Tracking Number (RTN) – When a release of oil and/or hazardous materials is reported to DEP, a tracking number is assigned through BWSC's response action tracking database. The public can access basic information about the status of any site in the database at: http://www.mass.gov/dep/bwsc/sites/report.htm.

Reportable Quantity - The quantity of oil or hazardous materials, the release of which or threat of release of which requires notification to the DEP.

Response Action Outcome (RAO) - Also referred to as a closure report in this document, an RAO constitutes the final document submitted for a site. The RAO contains all information that has been collected during the cleanup and documents, according to a professional opinion prepared by an LSP, that the site has been cleaned up to a condition of No Significant Risk.

School - Schools included in the study were identified as public and private, primary and secondary schools as identified by the Massachusetts Department of Education. The location and status of public schools were verified with the City of Fall River School Department.

State "Superfund" - At any point in the process, if the party potentially responsible for the assessment and cleanup of a contaminated site is either unable or unwilling to take needed actions, DEP can draw money from the state "superfund" to hire contractors to start and/or finish the job. DEP also has state contractors on standby 24 hours a day to respond to emergency and spill conditions, if necessary. If the state expends funds for such cleanups, DEP may recover up to 3 times its expenses from potentially responsible parties - a strong incentive for those parties that are financially capable to undertake the work themselves.

Tier Classification – Sites that are not cleaned up within one year after being reported to DEP are scored by the person conducting response actions using the MCP's numerical site ranking system and classified as Tier I or Tier II (see below). The date of Tier Classification starts the compliance "clock" running for submittal of Phase reports and a Response Action Outcome.

Tier I Site – If a site is classified as Tier I, a permit must be obtained from DEP before additional site investigation and cleanup can proceed. Tier I sites are further divided into three categories based on the complexity of the site.

Tier II Site – If a site is classified as Tier II, a permit does not need to be obtained from DEP additional site investigation and cleanup can proceed.

Utility-related Abatement Measure (URAM) – A URAM is conducted in response to contamination discovered during the installation, repair, replacement or decommissioning of underground utilities such as sanitary sewerage, water, or drainage systems, steam lines and natural gas pipelines.

Volatile Organic Compounds (VOCs) – VOCs are organic compounds with a boiling point less than 200 degrees Celsius. A wide array of VOCs are contained in and emitted by products used in home, office, school, and arts/crafts and hobby activities. These products, which number in the thousands, include:

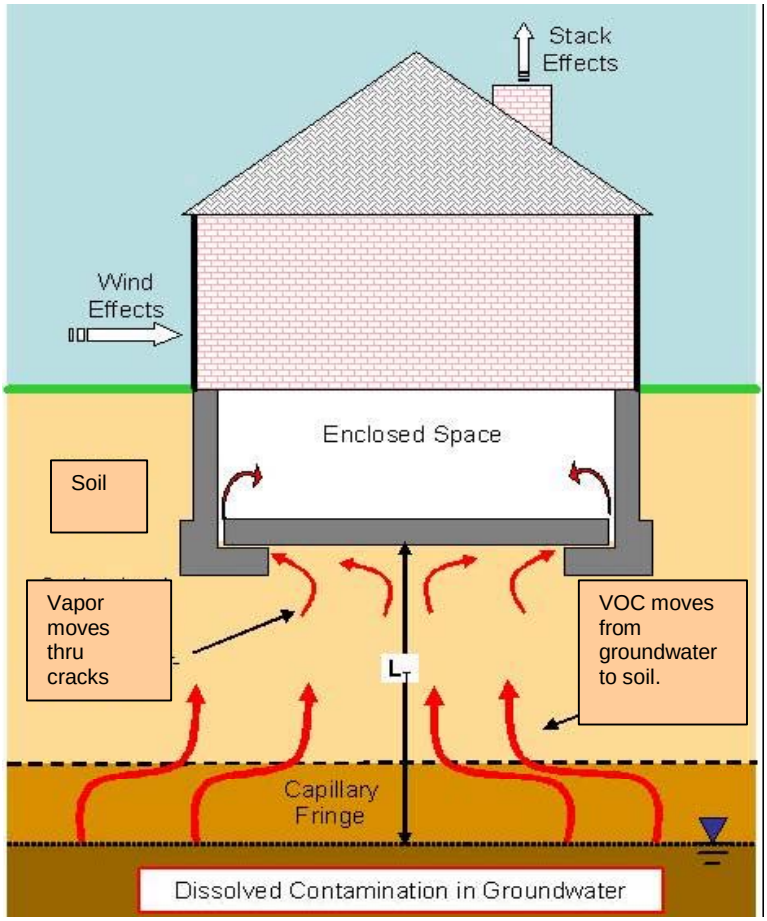
- personal items such as scents and hair sprays;
- household products such as finishes, rug and oven cleaners, paints and lacquers (and their thinners), paint strippers, pesticides (see below);
- dry-cleaning fluids;
- building materials and home furnishings;
- office equipment such as some copiers and printers;
- office products such as correction fluids and carbonless copy paper;
- graphics and craft materials including glues and adhesives, permanent markers, and photographic solutions.

Appendix D

Indoor Air Exposure Pathway

APPENDIX D - INDOOR AIR EXPOSURE PATHWAY

What leads to indoor air impacts?
Under the right conditions, certain volatile organic compounds **(VOCs**) can evaporate from groundwater and migrate upwards through soil. When this type of vapor migration happens in an undeveloped area, the vapor disperses into the ambient air. However, in certain circumstances, if there is a building in the way, vapors can enter the building and impact indoor air quality.



Chemicals of concern: Only certain chemicals are a concern. Metals like lead or chromium do not cause indoor air vapors problems. Chlorinated VOCs (e.g., dry cleaning chemicals like PCE or cleaning solvents like TCEC) are more of a problem then non-chlorinated VOCs (e.g., petroleum products). The non-chlorinated VOCs in petroleum don't typically migrate in groundwater more than a few hundred feet from the point they are released (e.g., from an underground tank leak) and they can rapidly biodegrade in soil beneath a building, essentially removing them from the soil. Chlorinated VOC contamination in groundwater can travel hundreds of feet and does not biodegrade quickly, allowing a wide area of to be impacted with persistent levels of contamination that have a higher potential to migrate upwards into buildings.

How do vapors get into buildings? Vapor migration to a building is more likely to happen if the building is "under-pressurized". There are a number of factors that cause under-pressurization:

- temperature differences between indoor air and the surrounding soils;
- wind and barometric pressure changes;
- "stack effects" of chimneys and flues;
- the operation of exhaust fans/vents; and
- negative pressures created by operation and venting of gas and oil furnaces.

During winter months, a frost layer, frozen ground or snow cover tends to increase the chance of vapor migration to buildings by temporarily preventing vapors from escaping through the exposed ground surface. This is also the time of year when heating boilers are in operation and windows remain closed.

Vapors from contaminated groundwater or soil can migrate into buildings through cracks in masonry foundations. Of particular concern are the small perimeter cracks that generally develop in poured concrete foundations at the intersection of the footing/wall/slab. Other problem areas are the annular spaces around utility pipes, holes in slabs for sump pumps and French drains or crawl spaces with dirt floors.

Testing: Testing for indoor air vapor problems is relatively easy. First, groundwater and soil near and under a building can be tested to see if chemicals that volatize are present at concentrations that might impact indoor air quality. Soil gas samples just beneath a concrete slab can be tested since vapors tend to accumulate here in void spaces. Finally, indoor air quality samples can be collected and analyzed for very low chemical concentrations (e.g. parts per billion).

Eliminating indoor air quality problems: In the short term, steps can be taken to prevent vapors from entering a building. Cracks in foundation floors and joints can be sealed with grout and/or latex caulking. Drainage sumps and crawl spaces can be covered, sealed and externally vented. Adjustments can be made to HVAC systems that allow for fresh/outside air to be used for combustion air in order to prevent depressurization problems. If these measures aren't successful, a sub-slab depressurization and venting system can be installed to collect vapors under a foundation and treat them, if necessary, before they are vented to the atmosphere. The long term and preferred permanent solution is to eliminate the source of the chemicals that is impacting groundwater and soil and, if necessary, treat contaminated groundwater that has migrated from the source area that is found to be causing indoor air quality problems.

Other sources of VOCs: A wide array of VOCs are contained in and emitted by products used in home, office, school, and arts/crafts and hobby activities. These products, which number in the thousands, include:

- personal items such as scents and hair sprays;
- household products such as rug and oven cleaners, paints and lacquers (and their thinners), paint strippers, pesticides;
- dry-cleaning fluids;
- building materials and home furnishings;
- office equipment such as some copiers and printers;
- office products such as correction fluids and carbonless copy paper; and
- graphics and craft materials including glues and adhesives, permanent markers, and photographic solutions.

Consumer and household products can cause concentrations of many VOCs to be consistently higher indoors than outdoors. A study by the EPA, covering six communities in various parts of the United States, found indoor levels up to ten times higher than those outdoors -- even in locations with significant outdoor air pollution sources, such as petrochemical plants.

Appendix E

Response Action Outcome Audit Table

Response Action Outcome Audit Table

RTN	Site_name	Address	Status	Date	Audit Date	Followup
3-0000548	US POSTAL SERVICE	BEACHAM ST EVERETT LINE	RAO A3	28-Jan-02	1/18/2002	none
3-0000821	NORTHEAST PETROLEUM	257-324 MARGINAL ST	RAO C&A3P	30-Oct-97	7/22/2003	none
3-0000921	SOLDIERS HOME	91 CREST AVE	RAO A2	27-Jun-00	7/5/2001	none
3-0001004	EXXON SERVICE STATION	979 BROADWAY	RAO A2	07-May-02	1/3/2003	none
3-0001791	WILLIAM ST COAL TAR DUMP FMR	276 BEACHAM ST	RAO B2	14-May-98	8/18/1998	none
3-0001795	**PROPERTY**	**295 EASTERN AVE**	**RAO A3**	**16-Dec-99**	**5/21/2001**	**none**
3-0001800	**JOSEPH BOTTI CO**	**102 CRESCENT AVE**	**RAO A1**	**15-Oct-97**	**10/23/1997**	**none**
3-0002029	LOGAN OFFICE COMPLEX	8-24 GRIFFIN WAY	RAO EQ	12-Feb-97	4/16/1997	
3-0002248	**BP GASOLINE STATION**	**251 EVERETT AVE**	**RAO A2**	**17-Nov-97**	**12/4/1997**	**none**
3-0002262	TANK FARM FMR	20-30 EDEN ST	RAO A2	05-Feb-97	NA	none
3-0002298	CHELSEA CREEK HEADWORKS	340 MARGINAL ST	RAO A3	17-Sep-01	10/31/2001	none
3-0002445	**NASCO INC**	**190 EVERETT AVE**	**RAO A2**	**12-Nov-98**	**1/21/2000**	**L3**
3-0002645	BELCHER TANK FARM	99 MARGINAL ST	RAO A2	14-Mar-97	4/7/2003	none
3-0003550	AMOCO PETROLEUM TERMINAL	111 EASTERN AVE	RAO C/A2	10-Nov-97	1/22/1997	none
3-0003669	NEW ENGLAND PRODUCE CENTER	90 NEW ENGLAND PRODUCE CTR	RAO C&A2	09-Aug-96	6/17/1999	none
3-0003671	**EMTEX**	**181 SPENCER AVE**	**RAO EQ**	**20-May-97**	**1997**	**none**
3-0004246	CHELSEA HOUSING AUTHORITY	449 CRESCENT AVE	RAO A2	15-Jan-99	1/21/1999	none
3-0004410	TOP GAS STATION	156 WILLIAMS ST	RAO EQ	04-Aug-97	8/7/1997	none
3-0010112	NO LOCATION AID	90 SPENCER AVE	RAO A3&B2	27-Oct-94	na	none
3-0010156	NO LOCATION AID	SUFFOLK ST SHURTLEFF ST	RAO A3	13-Apr-94	1/1/1993	none
3-0010214	BY WEBSTER AVE	REVERE BEACH PKWY	RAO D	08-Mar-94	NA	none
3-0010222	**VACANT LOT**	**315 CRESCENT AVE**	**RAO A3**	**25-Nov-94**	**na**	**none**
3-0010382	**NO LOCATION AID**	**721 BROADWAY**	**RAO A2**	**13-Dec-94**	**5/31/1995**	**none**
3-0010476	**GULF TERMINAL-CHEALSEA CREEK**	**281 EASTERN AVE**	**RAO A1**	**10-Oct-95**	**3/4/1996**	**none**
3-0010478	NO LOCATION AID	284 EASTERN AVE	RAO A2	17-Feb-95	NA	none
3-0010491	CHELSEA CREEK-OFF LOADING DOCK	11 BROADWAY	RAO A1	01-Apr-94	NA	none
3-0010556	FMR NATIVE POULTRY PROPERTY	215 WILLIAMS ST	RAO A3B2	31-Jan-95	6/17/1999	none
3-0010608	NO LOCATION AID	200 SECOND ST	RAO B1	30-Nov-93		
3-0010688	NO LOCATION AID	215 WILLIAMS ST	RAO A3&B2	31-Jan-95	6/17/1999	none
3-0010694	CORNER OF EASTERN AVE	285 CENTRAL AVE	RAO B2	30-Jan-97	3/12/1997	none

Response Action Outcome Audit Table

RTN	Site_name	Address	Status	Date	Audit Date	Followup
3-0010709	**GULF OIL TERMINAL**	**281 EASTERN AVE**	**RAO A1**	**17-May-94**	**1/30/1996**	**none**
3-0010750	**PARCEL 1,2,4,5**	**315 CRESCENT ST**	**RAO A3**	**15-Nov-96**	**1/1/1993**	**none**
3-0010776	BELOW WILLIAMS ST SECTION OF TOBIN BR	90-104 WILLIAMS ST	RAO A1	31-May-94	NA	none
3-0010822	NO LOCATION AID	135 CHESTNUT	RAO A1	06-Jun-94	NA	none
3-0010924	NEW ENGLAND PRODUCE CENTER	BEACHAM ST	RAO A1	23-Jun-94	NA	none
3-0010979	MARKET BASKET	SPRUCE ST	RAO A2	05-Aug-94	NA	none
3-0010989	ACROSS FROM MANSON CORP	155 CRESENT ST	RAO A2	30-Jul-04	10/7/2004	none
3-0011321	**M/V MILTA**	**37 MARGINAL ST**	**RAO A1**	**22-Sep-94**	**NA**	**none**
3-0011453	**MEMORIAL STADIUM**	**281 EVERETT AVE**	**RAO A2**	**11-Oct-94**	**2/3/2005**	**none**
3-0011620	VACANT BLDG	980 BROADWAY	RAO A1	22-Sep-95	4/18/1996	none
3-0011647	**WILLIAMS MIDDLE SCHOOL**	**170-180 WALNUT ST**	**RAO A3**	**28-Aug-98**	**9/12/1998**	**L2 AUL FIX**
3-0011673	NO LOCATION AID	257 MARGINAL ST	RAO C	30-Oct-97	11/12/1997	none
3-0011792	MANHOLE 25291	CHELSEA CRK AT MARGINAL ST	RAO A1	16-Feb-95	NA	none
3-0011842	OPPOSITE PRATVILLE SCHOOL FREMONT ST	423 WASHINGTON AVE	RAO A1	14-Dec-94	NA	none
3-0011846	CHELSEA CREEK/COASTAL OIL	99 MARGINAL ST	RAO A1	08-Nov-95	NA	none
3-0012152	**NO LOCATION AID**	**11 ORANGE ST**	**RAO A1**	**03-Mar-95**	**3/31/1995**	**none**
3-0012556	**SHURTLEFF SCHOOL**	**76 CONGRESS AVE**	**RAO B1**	**03-Jun-99**	**12/1/2004**	**none**
3-0012643	NO LOCATION AID	EVERETT AVE	RAO A1	31-Aug-95	NA	none
3-0012748	NO LOCATION AID	17 NORMANDY RD	RAO A1	12-Apr-96	NA	none
3-0012784	CHELSEA HOUSING AUTHORITY	39 NORMANDY RD	RAO A1	12-Apr-96	NA	none
3-0012785	CHELSEA HOUSING AUTHORITY	41 NORMANDY RD	RAO A1	12-Apr-96	NA	none
3-0012790	OFF GRIFFIN WAY	40-42 GERRISH AVE	RAO B2	02-Apr-96	6/17/1999	AUL inspection
3-0012837	NO LOCATION AID	4 SAIPAN RD	RAO A1	12-Apr-96	NA	none
3-0012838	NO LOCATION AID	6 SAIPAN RD	RAO A1	12-Apr-96	NA	none
3-0012845	NO LOCATION AID	8 SAIPAN RD	RAO A2	12-Apr-96	NA	none
3-0012846	CHELSEA HOUSING AUTHORITY	10 SAIPAN RD	RAO A2	12-Apr-96	NA	none
3-0012865	CHELSEA HOUSING AUTHORITY	374 REVERE BCH PWY RTE 16	RAO A1	12-Apr-96	NA	none
3-0012867	CHELSEA HOUSING AUTHORITY	376 REVERE BCH PWY RTE 16	RAO A1	12-Apr-96	NA	none
3-0012868	CHELSEA HOUSING AUTHORITY	12 SAIPAN RD	RAO A2	12-Apr-96	NA	none

Response Action Outcome Audit Table

RTN	Site_name	Address	Status	Date	Audit Date	Followup
3-0012869	CHELSEA HOUSING AUTHORITY	13 SAIPAN RD	RAO A2	12-Apr-96	NA	none
3-0012913	NO LOCATION AID	31-33 MARLBORO ST	RAO A3	18-Sep-96	8/27/1999	none
3-0013032	NO LOCATION AID	35 BURMA RD	RAO A2	12-Apr-96	na	none
3-0013033	NO LOCATION AID	37 BURMA RD	RAO A2	12-Apr-96	na	none
3-0013122	NO LOCATION AID	122 BROADWAY	RAO A2	18-Jan-00	1/26/1999	none
3-0013432	NO LOCATION AID	16 CHEEVER ST	RAO	06-Jun-96	8/20/1996	none
3-0013448	PAVED ROADWAY AT INTERSECTION	BROADWAY WILLIAMS ST	RAO	05-Apr-96	5/28/1996	none
3-0013544	CHELSEA CREEK	11 BROADWAY	RAO	20-May-96	6/14/1996	none
3-0013796	**FMR POST OFFICE**	**175 HAWTHORNE ST**	**RAO B1**	**20-Feb-97**	**7/16/1997**	**none**
3-0013919	**SPRUCE ST**	**151 EVERETT AVE**	**RAO A3**	**10-Aug-99**	**3/15/2000**	**none**
3-0014071	TANK FARM	99 MARGINAL ST	RAO A3	25-Sep-96	6/19/1905	none
3-0014122	NR BRADLEES/AT WEBSTER AVE	RTE 16 PARKWAY PLZ	RAO A3	11-Oct-96	NA	none
3-0014181	SUFFOLK/CONGRESS/HIGHLAND	22 WILLOW ST	RAO A3	16-Jan-01	7/19/2001	none
3-0014339	SUFFOLK/CONGRESS/HIGHL	22 WILLOW ST	RAO A3	16-Jan-01	7/19/2001	none
3-0014476	TOBIN BRIDGE MAINT GARAGE	62 BROADWAY	RAO A2	10-Nov-97	12/18/1997	none
3-0014675	FR TOBIN BRIDGE EXIT	BEACON ST	RAO A1	20-Feb-97	3/12/1997	none
3-0014812	NE PRODUCE MKT	300 BEECHAM ST	RAO A1	07-Apr-97	NA	none
3-0014827	NO LOCATION AID	120 EASTERN AVE	RAO A3	30-Apr-99	3/28/2000	none
3-0015159	PEZZI SERVICE CTR	571 WASHINGTON AVE	RAO A2	27-Mar-98	4/1/1998	none
3-0015176	OLD POLICE STATION	19 PARK ST	RAO A2	04-Jun-98	7/14/1998	none
3-0015177	**NO LOCATION AID**	**28 GERRISH AVE**	**RAO A2**	**10-Jun-03**	**6/24/2003**	**none**
3-0015178	NO LOCATION AID	TOBIN BRG, BEACON ST ramp	RAO D A1	28-Jul-97	NA	none
3-0015259	NO LOCATION AID	122 BROADWAY	RAO	18-Jan-00	1/26/1999	none
3-0015318	STRIKER TRANSPORTATION	85 MARKET ST	RAO A2	22-Nov-99	2/17/2000	none
3-0015330	COTTAGE ST & BELLINGHAM ST	80 EASTERN AVE	RAO A2	24-Jul-97	2/3/2005	none
3-0015365	**GLENMOR OIL**	**295 EASTERN AVE**	**RAO A1**	**01-Oct-97**	**NA**	**none**
3-0015421	**NO LOCATION AID**	**99 EVERETT AVE**	**RAO A2**	**13-Aug-97**	**12/18/1997**	**none**
3-0015990	FITZGERALD SHIPYARD	39 WINNISIMMET ST	RAO A1	26-Jan-01	2/12/2001	none
3-0016509	AT MARKET ST	357 BEACHAM ST	RAO B2	05-Mar-98	8/31/1999	none
3-0016572	**NO LOCATION AID**	**281 EASTERN AVE**	**RAO A2**	**16-Jul-98**	**8/28/1998**	**none**

Response Action Outcome Audit Table

RTN	Site_name	Address	Status	Date	Audit Date	Followup
3-0016789	**NO LOCATION AID**	**201 MAPLE ST**	**RAO A2**	**19-May-99**	**5/19/1999**	**none**
3-0017025	NO LOCATION AID	10 BROADWAY	RAO D A1	12-Jan-99	NA	none
3-0017142	NO LOCATION AID	215 WILLIAMS ST	RAO A1	12-Aug-99	10/28/1999	none
3-0017266	MWRA RIGHT OF WAY	MARGINAL ST	RAO A2	14-Dec-01	NA	none
3-0017357	COASTAL OIL BULK OIL TERMINAL	99 MARGINAL ST	RAO B1	28-Sep-98	1/29/1999	none
3-0017421	DPW PUBLIC SAFETY BLDG	38 SAGAMORE ST	RAO A2	11-Feb-99	1999	none
3-0017467	LOADING RACK E	11 BROADWAY	RAO A1	30-Dec-98	1/21/1999	none
3-0017597	**GREGS SERVICE STATION**	**51 PARK ST**	**RAO A2**	**08-Mar-99**	**8/24/1999**	**none**
3-0017621	NEAR CHESTNUT ST	WILLIAMS ST	RAOB1	19-Nov-99	3/2/2000	none
3-0017640	NO LOCATION AID	1020 REVERE BEACH PKWY	RAO B2	07-Jan-04	6/16/2004	data audit
3-0017646	POLE 11	BEACHAM ST	RAO A1	15-Dec-98	3/2/1999	none
3-0017653	NEAR MARGINAL WAY/MEDFORD ST	11 BROADWAY	RAO A1	26-Jan-99	1/29/1999	none
3-0017722	**NO LOCATION AID**	**2 GRIFFIN WAY**	**RAO A3**	**27-Mar-03**	**3/4/2004**	**none**
3-0017739	NO LOCATION AID	11 BROADWAY	RAO A1	12-Feb-99	6/17/1999	none
3-0017824	LOADING RACK M	11 BROADWAY	RAO A1	05-Mar-99	8/29/1999	none
3-0017856	NO LOCATION AID	31 SECOND ST	RAO A2	14-Jul-03	8/26/2003	none
3-0017914		**203 EVERETT AVE**	**RAO**	**27-Jan-05**		
3-0017915	**INTRSCTN W/ BEECH ST**	**204 MAPLE ST**	**RAO B1**	**27-Dec-00**	**1/31/2001**	**none**
3-0017916	**NO LOCATION AID**	**144 BEECH ST**	**RAO B1**	**01-Feb-00**	**3/21/2000**	**none**
3-0017918	**INTRSCTION W/ MAPLE ST**	**177 EVERETT AVE**	**RAO B1**	**27-Oct-99**	**NA**	**none**
3-0017919		**211 EVERETT AVE**	**RAO**	**27-Jan-05**		
3-0017920	INTRSCTN W/ BEECH ST	190 THRU 200 SPRUCE ST	RAO B1	27-Oct-99	NA	none
3-0018006	NO LOCATION AID	644 WASHINGTON AVE	RAO A2	16-Jul-04	2/3/2005	none
3-0018195	**EASTERN MINERALS SALT DOCK**	**37 MARGINAL ST**	**RAO A1**	**21-Jun-99**	**9/27/1999**	**none**
3-0018612	SHAWMUT PRINTING PARKING LOT	135 LIBRARY ST	RAO B1	02-Jul-99	2/17/2000	none
3-0018693		EVERETT AVE	RAO	27-Jan-05		
3-0018765	TROPICAL BANANA FACILITY	350 BEACHAM ST	RAO A1	04-Nov-99	1/25/2000	none
3-0018862	NO LOCATION AID	100 BELLINGHAM ST	RAO A2	23-Dec-99	3/16/2000	none
3-0018897	**NO LOCATION AID**	**190 EVERETT AVE**	**RAO A2**	**15-Mar-00**		
3-0018938	TRUCK RACK TERMINAL FACILITY	11 BROADWAY	RAO A1	06-Jan-00	2/17/2000	none

Response Action Outcome Audit Table

RTN	Site_name	Address	Status	Date	Audit Date	Followup
3-0019061	TRUCK RACK BAY F	11 BROADWAY	RAO A1	04-Feb-00	2/17/2000	none
3-0019111	**NO LOCATION AID**	**284 EASTERN AVE**	**RAO A1**	**22-Feb-00**	**9/28/2000**	**none**
3-0019212	**CRESCENT AVE**	**298 EASTERN AVE**	**RAO B2**	**22-May-00**	**6/28/2001**	**none**
3-0019231	TRUCK RACK F	11 BROADWAY	RAO A1	03-Apr-00	NA	none
3-0019232	TRUCK RACK I	11 BROADWAY	RAO B2	03-Apr-00	8/5/2003	none
3-0019357	MWRA	340 MARGINAL ST AND CENTRAL	RAO A1	15-Mar-00	10/23/2000	none
3-0019484	**NO LOCATION AID**	**281 EASTERN AVE**	**RAO A2**	**18-Jul-00**	**NA**	**none**
3-0019555	NO LOCATION AID	76 ORANGE ST	RAO A1	28-Sep-01	10/17/2001	none
3-0019648	**FORMER GAS STA**	**141-145 WASHINGTON AVE**	**RAO A2**	**03-Nov-03**	**4/13/2004**	**none**
3-0019694	NO LOCATION AID	300 BEACHAM ST	RAO A1	12-Sep-00	NA	none
3-0020136	NO LOCATION AID	CHESTNUT @ PINE ST	RAO D A1	18-Mar-04	NA	none
3-0020141	NO LOCATION AID	90 NEPC	RAO A1	19-Mar-01	NA	none
3-0020228	NO LOCATION AID	197 CRESCENT ST	RAO A2	07-Feb-01	NA	none
3-0020279	**NO LOCATION AID**	**204 MAPLE ST**	**RAO B1**	**01-May-02**	**NA**	**none**
3-0020336	**PARKING LOT**	**151 CRESCENT AVE**	**RAO A2**	**26-Apr-01**	**7/18/2001**	**none**
3-0020384	NO LOCATION AID	100 REVERE BEACH PKWY	RAO B1	09-Feb-01	5/9/2001	none
3-0020399	CROSSECTION WITH EXETER	571 WASHINGTON AVE	RAO A1	05-Nov-01	2/5/2002	none
3-0020630	ROADSIDE	167 BEACHAM ST	RAO A2	14-Jun-01	NA	none
3-0020658	REVERE BCH PKWY NEAR CORNER OF WEBSTER	RTE 16 E	RAO A1	18-Jun-01	NA	none
3-0020688	42-23-28N 71-02-36	156 WILLIAMS ST	RAO A1	27-Aug-01	2001	none
3-0020769	INTERSECTION WITH MURRAY ST	REVERE BEACH PKWY RTE 16 W	RAO A1	07-Aug-01	11/1/2001	none
3-0020829	NO LOCATION AID	155 SIXTH ST	RAO A2	13-May-02	2/3/2005	none
3-0020920	NO LOCATION AID	360 BEACHAM	RAO B2	15-Nov-01	7/18/2002	none
3-0021047	**NO LOCATION AID**	**63 WASHINGTON AVE**	**RAO B2**	**22-Apr-02**	**7/18/2002**	**none**
3-0021105	NO LOCATION AID	172 WILLIAMS ST	RAO A1	27-Nov-01	2/6/2002	none
3-0021194	VALE CARTER NW INTERSECTION	VALE ST	RAO A3	17-Jul-03		L1
3-0021195	NO LOCATION AID	390 BEACHAM ST	RAO A3	25-Nov-03	4/14/2004	none
3-0021422	BROADWAY AND MEDFORD ST	11 BROADWAY	RAO A1	18-Mar-02	7/2/2002	none
3-0021691	CORNER OF WILLIAMS ST	WINNISIMMET ST	RAO A1	20-May-02	6/11/2002	none

Response Action Outcome Audit Table

RTN	Site_name	Address	Status	Date	Audit Date	Followup
3-0021807	BROADWAY AND MEDFORD ST	11 BROADWAY	RAO A2	25-Jul-02	11/18/2002	none
3-0021885	FRONT OF 56	ELEANOR ST	RAO A1	10-Sep-02	9/12/2002	none
3-0022105	INTERSECTION	WASHINGTON AVE AND SAGAMORE ST	RAO A1	19-Sep-02	9/19/2002	none
3-0022181	NO LOCATION AID	16 TREMONT ST	RAO A1	04-Dec-02	2/5/2003	none
3-0022489	**NO LOCATION AID**	**214 ARLINGTON ST**	**RAO B2**	**14-Apr-04**	**3/7/2005**	**none**
3-0022493	NO LOCATION AID	11 BROADWAY	RAO A3	18-Mar-03	3/25/2003	none
3-0022647	NEW ENGLAND PRODUCE	MARKET AND BEACHAM STS	RAO A1	21-May-03	7/1/2003	none
3-0022884	MARKET ST	300 BEACHAM ST	RAO A1	04-Aug-03	9/17/2003	none
3-0022941	TANK NO 201	11 BROADWAY	RAO A1	19-Aug-03	10/7/2003	none
3-0022997	MILL CREEK CONDOMINIUMS	165 COTTAGE ST	RAO B1	16-Dec-03		
3-0023066	NO LOCATION AID	11 BROADWAY	RAO A2	03-Oct-03	11/3/2003	none
3-0023095	POLE 32/25	COOLIDGE AVE	RAO A1	27-Aug-03	11/6/2003	none
3-0023166	**NO LOCATION AID**	**181 SPENCER AVE**	**RAO A2**	**12-Jan-04**	**1/29/2004**	**data audit**
3-0023368	FMR NSTAR STA NO 61	57-61 CRESCENT AVE	RAO B1	13-Nov-03	11/19/2003	none
3-0023403	WASHINGTON SQUARE	226 WASHINGTON AVE	RAO A2	09-Jun-04	7/9/2004	data audit
3-0023445	NEW ENGLAND PRODUCE CENTER	MARKET ST	RAO A1	27-Feb-04	3/17/2004	none
3-0023451	CHELSEA TERMINAL RACK F	11 BROADWAY	RAO A1	13-Feb-04	4/1/2004	none
3-0023477	PARKING LOT OF KETTLE CUISINE	270 2ND ST	RAO A1	19-Feb-04	4/5/2004	none
3-0023628	NO LOCATION AID	11 BROADWAY	RAO A1	03-May-04	8/2/2004	none
3-0023683	CHELSEA TERMINAL RACK F	11 BROADWAY	RAO A1	12-May-04	5/21/2004	none
3-0023706	**GLYPTAL INC**	**305 EASTERN AVE**	**RAO A1**	**28-Jun-04**	**NA**	**none**
3-0023727	NEW ENG PRODUCE CTR WEST END	300 BEACHMAN ST	RAO A1	07-Jun-04	7/14/2004	none
3-0024068	NSTAR STA#445 TRANS 445 2136	CRESCENT AVENUE AND VILLA ST	RAO A2	11-Aug-04	8/24/2004	data audit
3-0024122	CHELSEA SANDWICH LLC TANK 203	11 BROADWAY	RAO A2	12-Oct-04	10/30/2004	none
3-0024187	GLOBAL FUELING RACK	11 BROADWAY	RAO A1	19-Oct-04	11/22/2004	none
3-0024454	CHELSEA ARMORY	113 SPENCER AVE.	RAO A2	25-Feb-05	3/15/2005	none